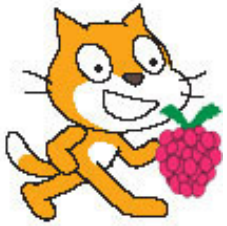
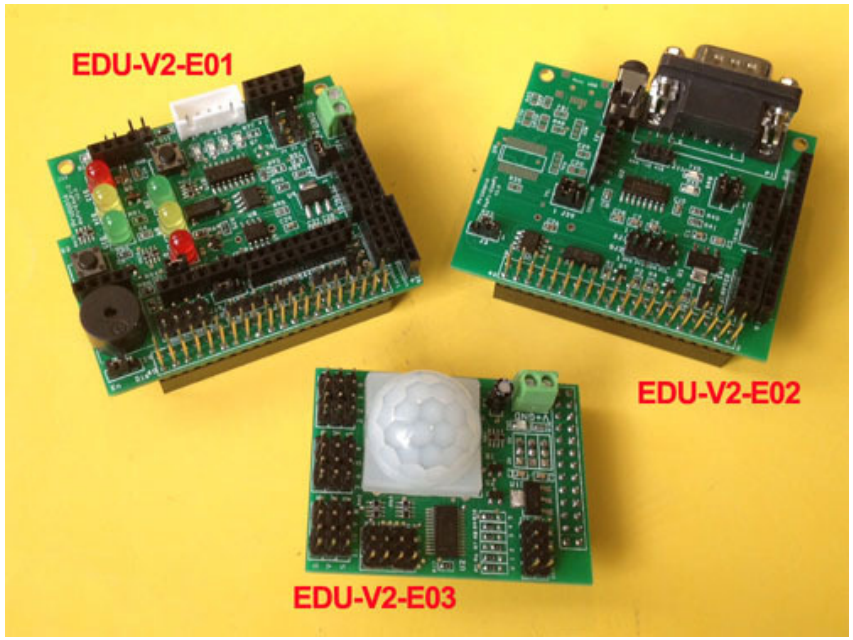
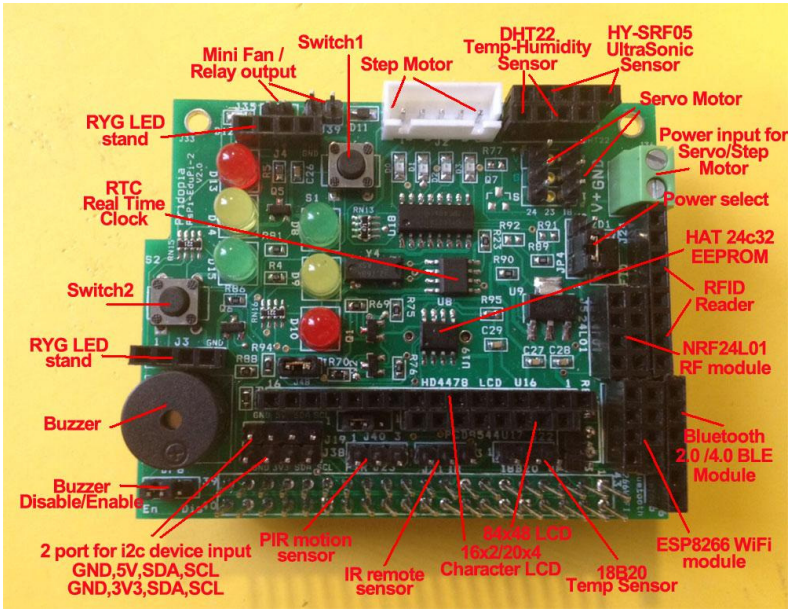


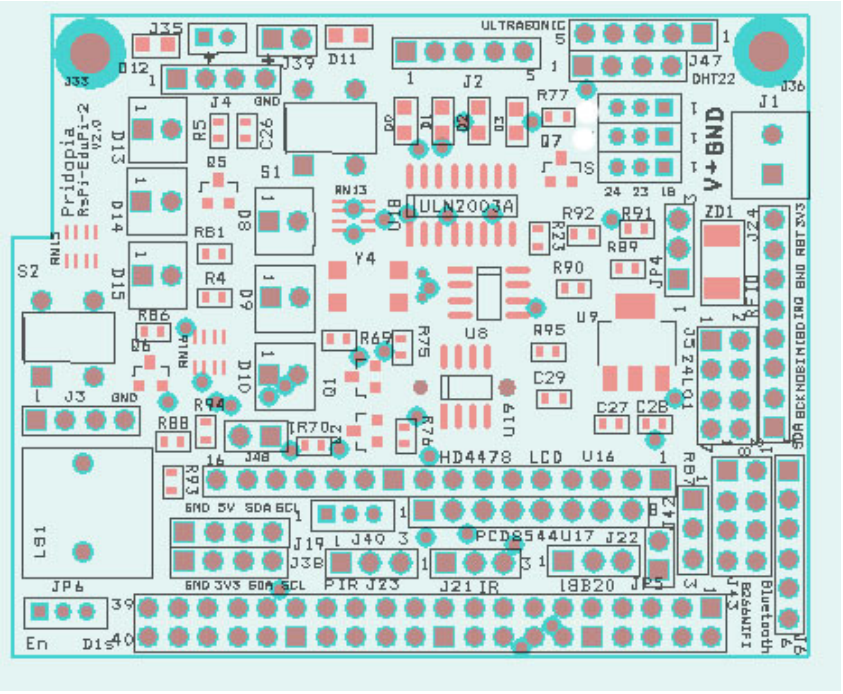
Scratch Raspberry Pi control

Pi Scratch V 2.76 B+

EDU Learning Board V-2 User Manual







Pridopia Limited

Tony Chang

30,Jun,2015

Raspberry Pi is a trademark of the Raspberry Pi Foundation

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EDU Learning Board v2 GPIO List

	StepMotor1	DS18b20 Temp Sensor	IR remote Sensor	PIR motion sensor	Buzzer	DHT22	UltraSonic
GPIO17	v						
GPIO18	v						
GPIO27	v					v	v
GPIO22	v						v
GPIO23			v	v			
GPIO24					v		
GPIO25							
GPIO4		v					

	Green LED 1	Yellow LED 1	Red LED 1	Green LED 2	Yellow LED 2	Red LED 2
GPIO12	v					
GPIO13		v				
GPIO19			v			
GPIO16				v		
GPIO21					v	
GPIO26						v

SPI signal	RFID	NRF24L01
GPIO7(CE1)		
GPIO8(CE0)	v	v
GPIO9(MISO)	v	v
GPIO10(MOSI)	v	v
GPIO11(SCLK)	v	v
GPIO25		v

TXD/RXD	WiFi Module	Bluetooth
GPIO14 (TXD)	v	v
GPIO15(RXD)	v	v

	Micro SW 1	Micro SW 2	Mini Fan
GPIO20	v		
GPIO6		v	
GPIO5			v

i2c signal	RTC	HAT EEPROM
GPIO2(SDA)	v	
GPIO3(SCL)	v	
ID_SD		v
ID_SC		v

1.The EDU Learning Board provide RTC clock with CR1220 3V Backup Battery.

2. provide 2 switch control 2 sets Traffic light , provide python traffic light program.

3. provide RFID Reader socket (SPI signal) / NRF24L01 socket (SPI signal)

you can choose use RFID or NRF24L01 (both use SPI signal)

4. Provide 2 extra i2c device input port, one for 3.3V, one for 5V

5. provide 3.3V power Regulator for 3.3V device (RFID/ NRF24L01/ESP8266) i2c device

6. provide DS18B20 temperature sensor socket (GPIO4)

7. provide IR Receiver sensor socket (GPIO23)

8. provide IR PIR motion sensor socket (GPIO23)

9 provide 1 5V 28BYJ-48 Step Motor socket (5V can select from Pi or external)

(GPIO 17,18,27,22) Step Motor

10 provide 1 buzzer (GPIO24)

11 provide 2 sets traffic light

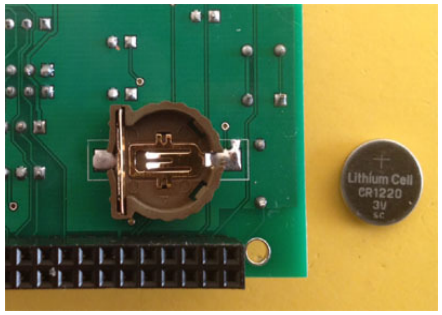
first set traffic light Red (GPIO19), Yellow(GPIO13), Green (GPIO12) ,Switch 1(GPIO20)

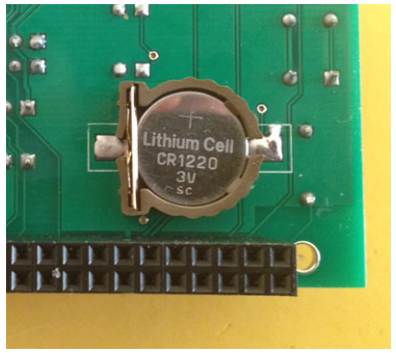
second set traffic light Red (GPIO16), Yellow(GPIO21), Green (GPIO26) ,Switch 2(GPIO6)

Below are the new functions we added in V2

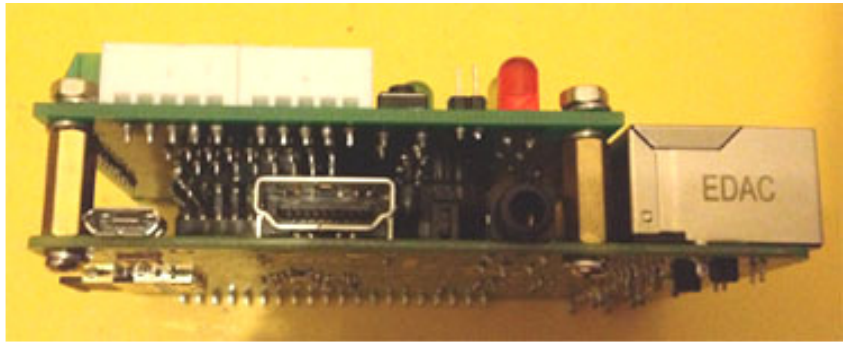
- **2 x R,Y,G LED display stand set**
- **2 x Servo motor socket GPIO 18,24**
- **HAT EEPROM 24c32 support on board**
- **1 x DHT22 Temperature & Humidity sensor socket**
- **HY-SRF05 Ultrasonic distance sensor socket**
- **16x2/20x4 character LCD socket**
- **84x48 Pixels Monochrome LCD socket**

Install EDU Learning Board
(1) Install RTC Battery





(2) Install PCB spacer

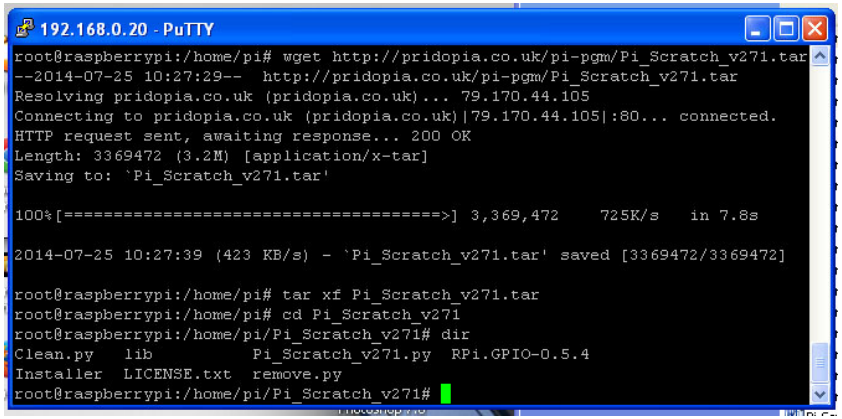


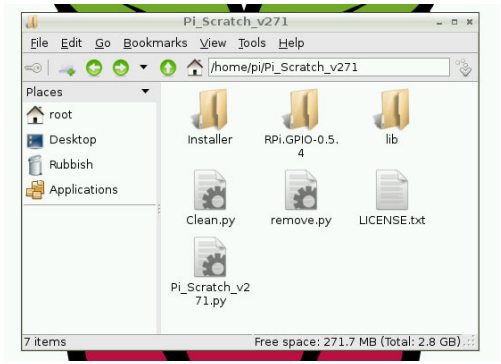
Download program pack from our web site

sudo wget http://pridopia.co.uk/pi-pgm/Pi_Scratch_v276.tar

tar xf Pi_Scratch_v276.tar

cd Pi_Scratch_v276





You will find inside folder **Pi_Scratch_v276**
have 1 library folder **lib**
one WebIoPi-0.6.0 **support DAC function**
one installer folder include two python tools **Install-With-Scratch.py & Install-Without-Scratch.py** for setting Auto Login & Auto Load Pi_Scratch
Install-autorun-Scratch.py - for auto run example without press any key
one Tools install all necessary program **install.py**
RFID-Installer.py Install RFID tools pack
one License document **LICENSE.txt**
one main program **Pi_Scratch_v276-B.py**

* set up the auto login & auto start manually.

setting Auto login -> startx -> Scratch -> load file for Pi_Scratch

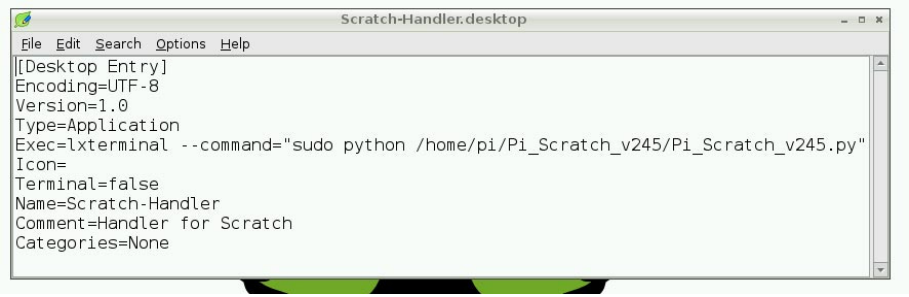
1. Copy the two [.desktop] files to ~/.config/autostart/ and to the desktop at ~/.Desktop

You can use "**sudo python Install-With-Scratch.py** " this will help you create a folder and copy two files to the folder & install Auto login -> startx -> Pi_Sratch

You can use "**sudo python Install-Without-Scratch.py** " this will help you create a folder and copy two files to the folder & install Auto login

Two desktop files you can modify

Scratch-Handler

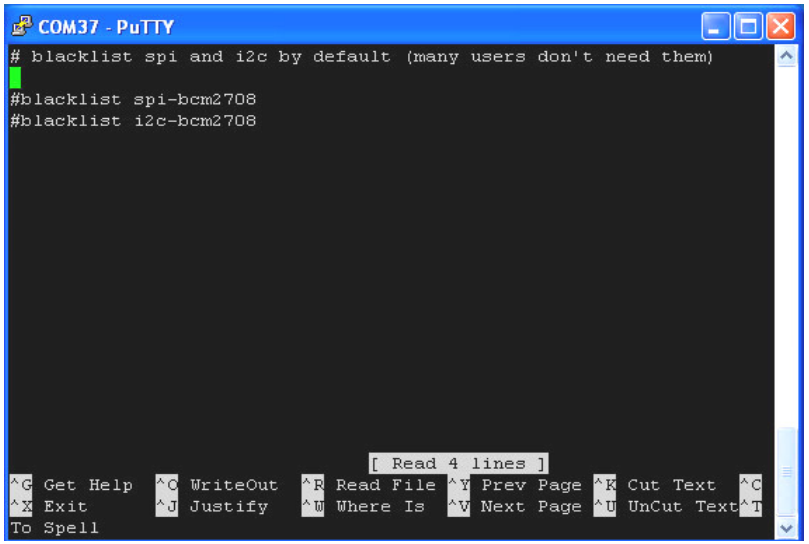


Scratch-File

1.Make sure your I2C driver are enable

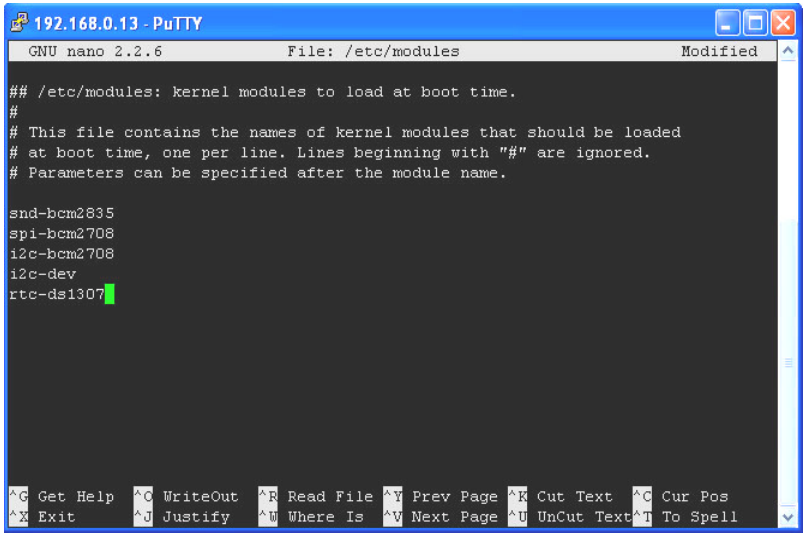
To enable it all you need to do is comment out a line by putting # in front

sudo nano /etc/modprobe.d/raspi-blacklist.conf



2. Add i2c-dev in /etc/modules by use

sudo nano /etc/modules



3. Next install the python-smbus python module:

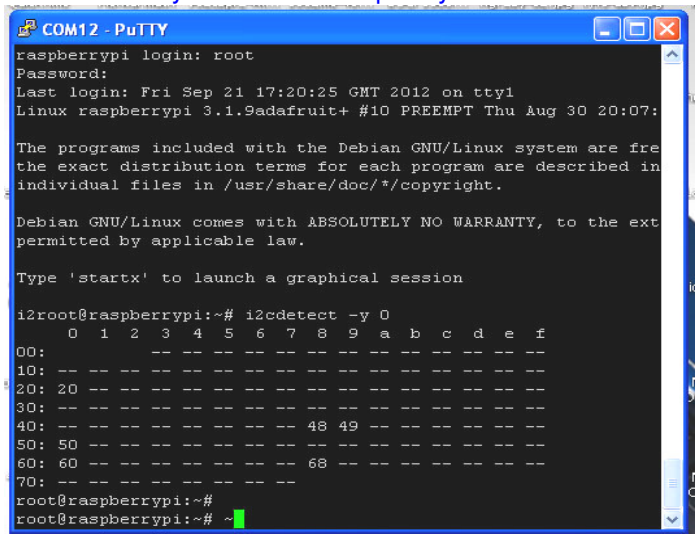
sudo apt-get install python-smbus

sudo apt-get install i2c-tools

Now you are ready to use the i2c with python.

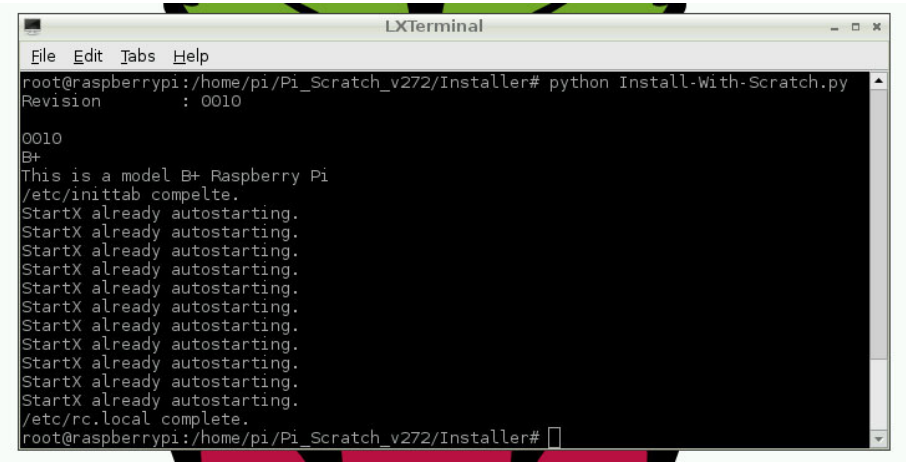
If you already install I2c driver ,

i2cdetect -y 0 - for Raspberry Pi V1 board



i2cdetect -y 1 - for Raspberry Pi V2 Board

B+ detect and install



In Installer folder , type "python Install-With-Scratch.py" System will auto detect model B+, and install Pi_Scratch for model B+
In "Pi_Scratch_v272-B" folder

install other necessary software package

use our **install.py** will help you install WebIOPi , spidev & RPIO

sudo python install.py

(1) install WebIOPi

goto folder "WebIOPi-0.6.0" → "Python" →

run the command:

sudo python setup.py install

(2) install spidev

sudo apt-get install git

Then install py-spidev:

git clone git://github.com/doceme/py-spidev

cd py-spidev/

sudo python setup.py install

(3) install GPIO Library

https://pypi.python.org/pypi/RPi.GPIO GPIO library

GPIO library - RPi.GPIO-0.5.6.tar.gz

Install python , library and run the test program

 # sudo apt-get install python-dev

 # wget http://www.pridopia.co.uk/pi-pgm/RPi.GPIO-0.5.6.tar.gz

 # gunzip RPi.GPIO-0.5.6.tar.gz

 # tar –xvf RPi.GPIO-0.5.6.tar

 # cd RPi.GPIO-0.5.6

 # sudo python setup.py install

(4) install **RPIO** 0.10.0

https://pypi.python.org/pypi/RPIO#downloads

 # sudo apt-get install python-setuptools

 # sudo easy_install –U RPIO

Install IR diver by manually

(5) LIRC module

 # sudo apt-get install lirc

(6) python LIRC module

https://pypi.python.org/pypi/python-lirc/1.1

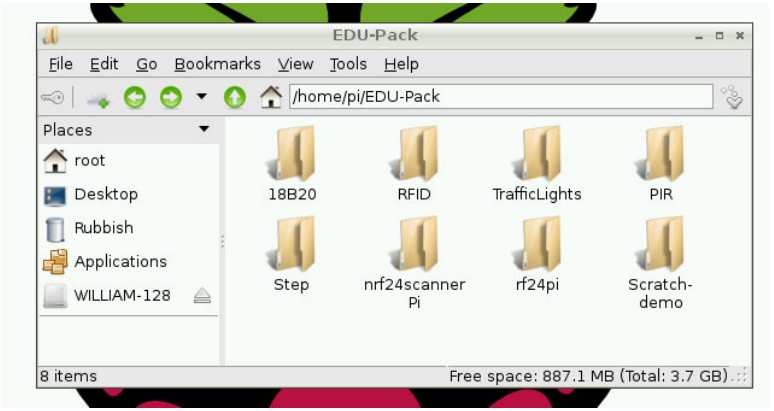
 # sudo apt-get install python-lirc

finished all necessary software install.

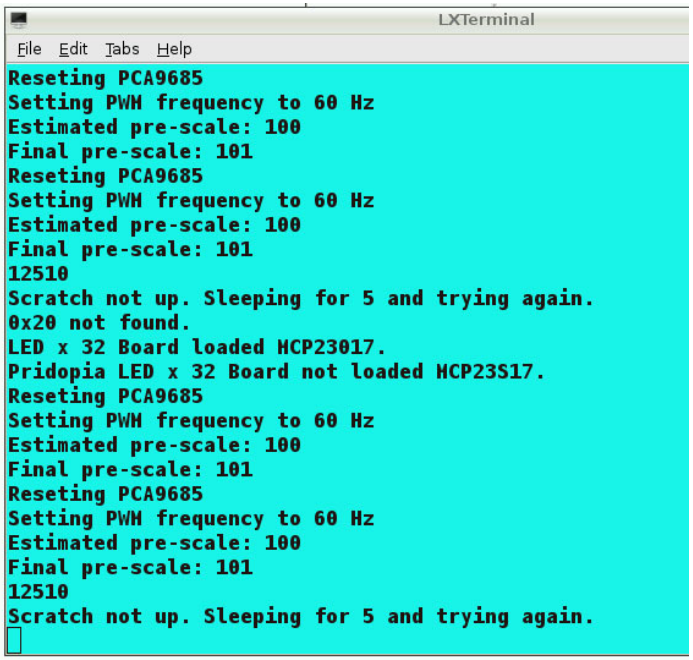
sudo Pi_Scratch_v276-B.py

sudo Pi_Scratch_v276-B.py -d in debug mode with more information display

sudo wget http://pridopia.co.uk/pi-pgm/EDU-Pack.tar



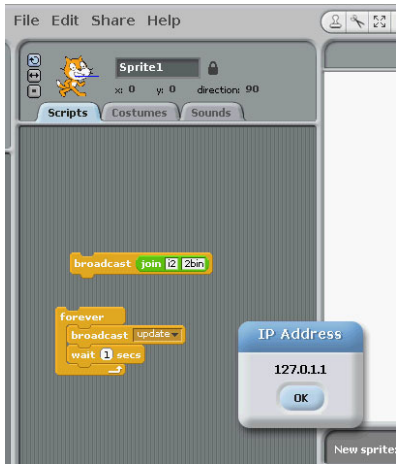
EDU Learning Board Software Pack



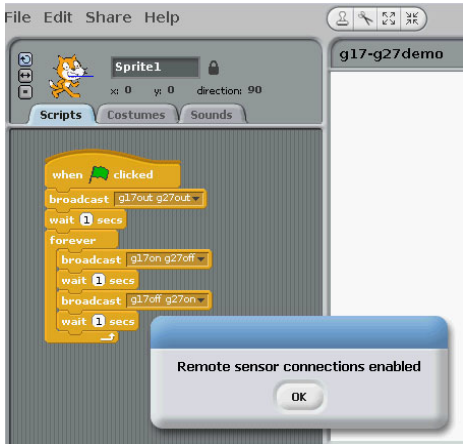
The Program will run and waiting for Scratch connect …

1. **Shift-click the Share in menu bar choose "Host Mesh".**

2. **choose Host Mesh --- will appear a IP address windows**



The Program run in back ground detect all the device connect to Raspberry Pi. You can use Scratch with GPIO control function now.



***** For the first time use Pi_Scratch**

Load "g17-g27demo.sb" demo program first, shift-click "Share " → Host Mesh --→ will appear a IP address windows "Ok"

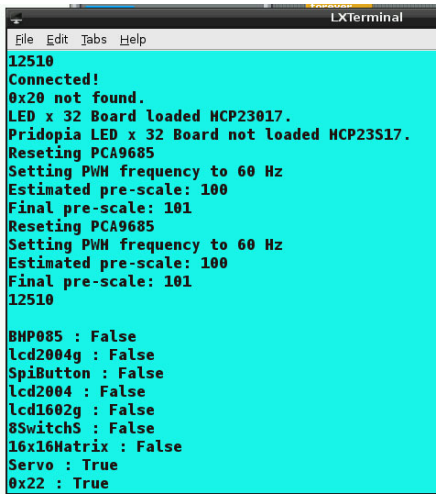
Then save this project in your pi again.

Next time you can load "g17-g27demo" the scratch will automatic connect our "Pi_Scratch" , with "**Remote sensor connections enable**" window, you don't need choose "Host Mesh" every time"

***** You can run Scratch in PC use "Join Mesh"**

To control Raspberry Pi (need IP for your Raspberry Pi)

Raspberry Pi in " Host Mesh"



Minimum Requirements – a Raspberry Pi with Raspbian (wheezy) installed

	StepMotor1	DS18b20 Temp Sensor	IR remote Sensor	PIR motion sensor	Buzzer	DHT22	UltraSonic
GPIO17	v						
GPIO18	v						
GPIO27	v					v	v
GPIO22	v						v
GPIO23			v	v			
GPIO24					v		
GPIO25							
GPIO4		v					

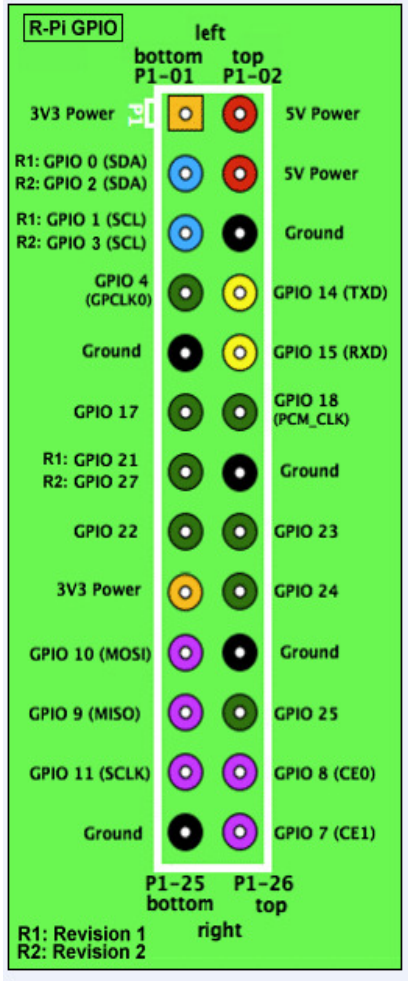
	Green LED 1	Yellow LED 1	Red LED 1	Green LED 2	Yellow LED 2	Red LED 2
GPIO12	v					
GPIO13		v				
GPIO19			v			
GPIO16				v		
GPIO21					v	
GPIO26						v

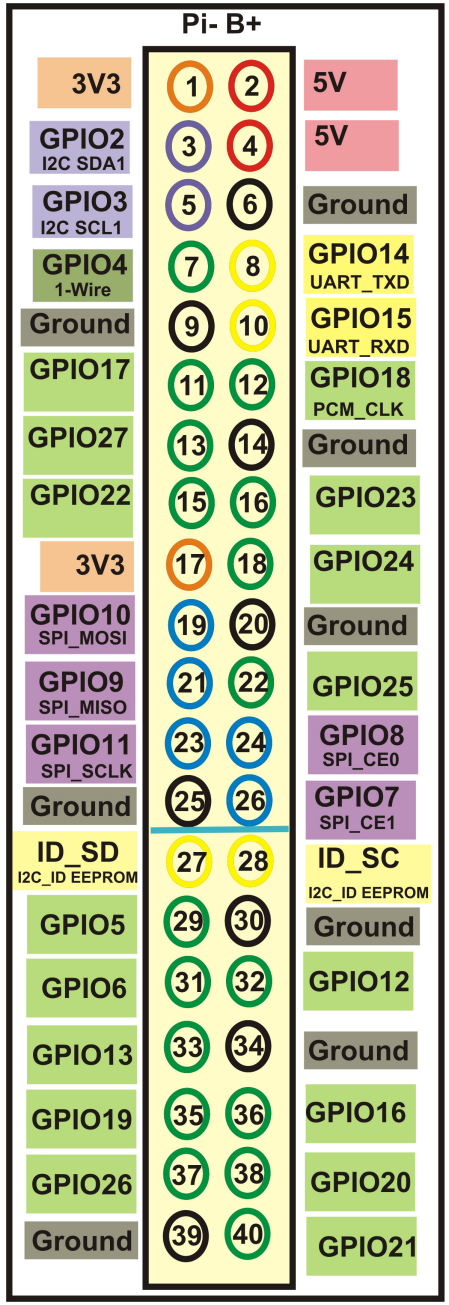
SPI signal	RFID	NRF24L01
GPIO7(CE1)		
GPIO8(CE0)	v	v
GPIO9(MISO)	v	v
GPIO10(MOSI)	v	v
GPIO11(SCLK)	v	v
GPIO25		v

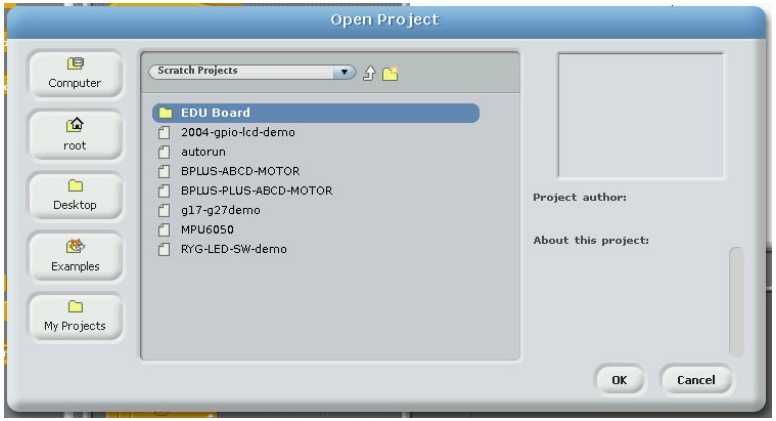
TXD/RXD	WiFi Module	Bluetooth
GPIO14 (TXD)	v	v
GPIO15(RXD)	v	v

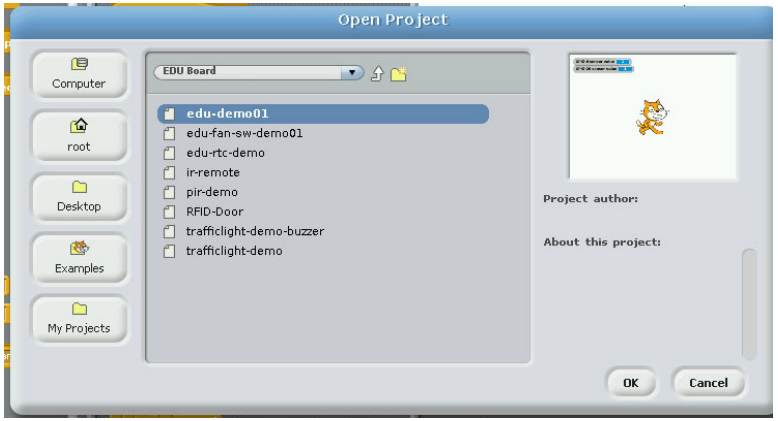
	Micro SW 1	Micro SW 2	Mini Fan
GPIO20	v		
GPIO6		v	
GPIO5			v

i2c signal	RTC	HAT EEPROM
GPIO2(SDA)	v	
GPIO3(SCL)	v	
ID_SD		v
ID_SC		v





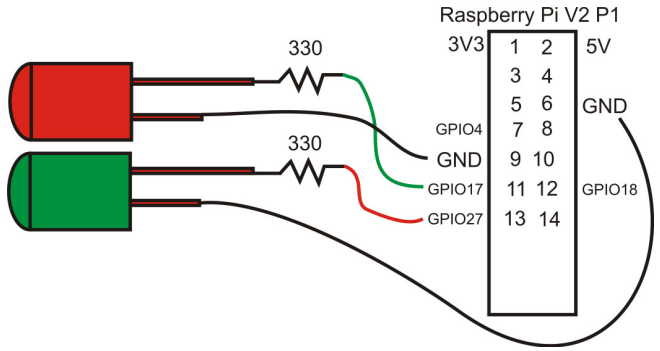




Scratch demo code

Our "**Pi_Scratch**" for scratch V1.4 driver

The main goal for this software is towards helping children / beginner programmers / hardware enthusiasts build up their skills by doing simple tasks with even easier commands / controls.



1.The Pi_Scratch use GPIO number (BCM) not raspberry pi pin number. so can support V2 P5 (GPIO 28,29,30,31) four extra GPIO pins.

2. example 1)define GPIO as input or output

g17out ---> GPIO17 output (P1 pin 11) g17in --> GPIO17 input

2) set GPIO g17on -->PIO17 on(High) g17off ---> GPIO17 off(Low)

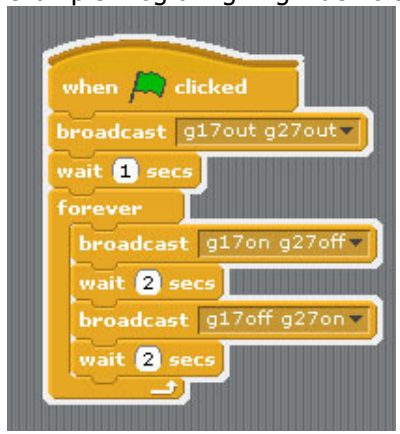
Example : 1.G17out g27out (g17,g27 LED on off) Delay 1 sec

2 G17on g27off delay 2 sec

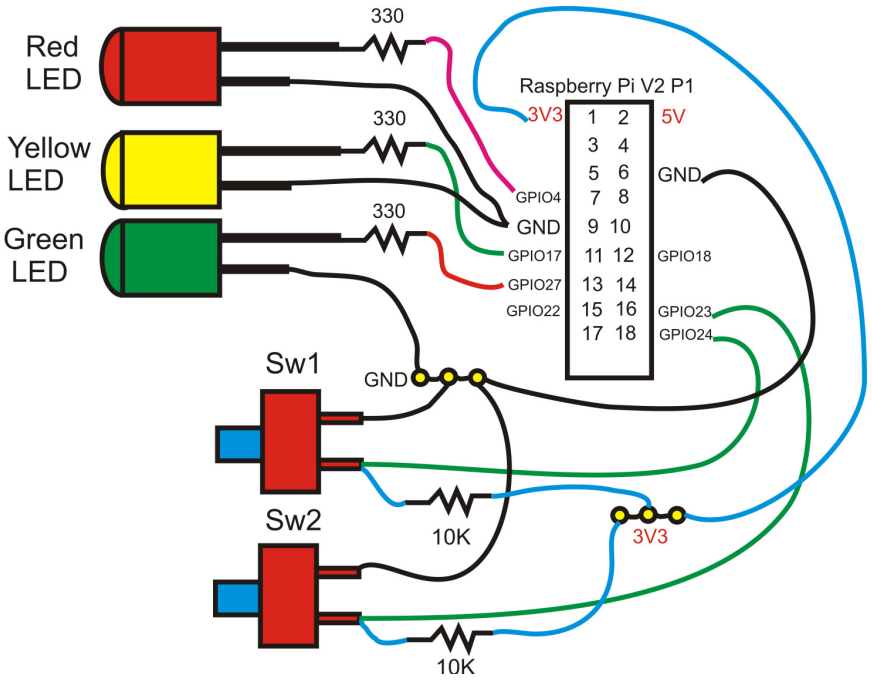
3 G17off g27on delay 2sec

4 goto step 2

example Program g17-g27demo.sb g17-g27demo.py

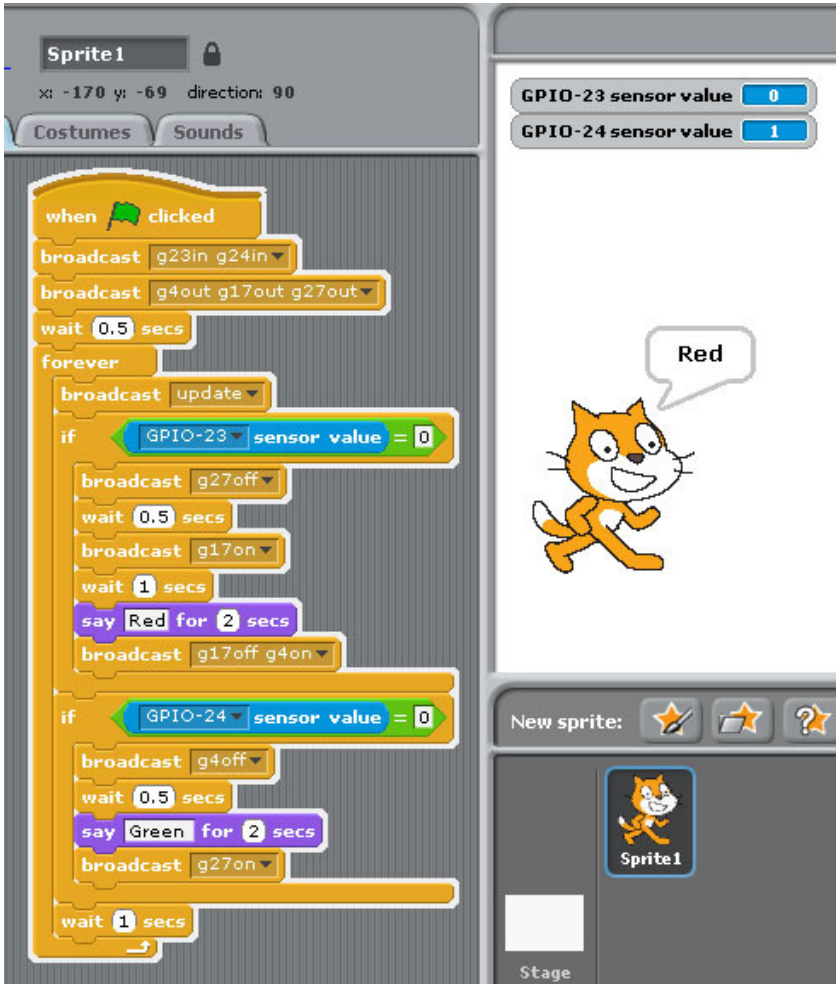


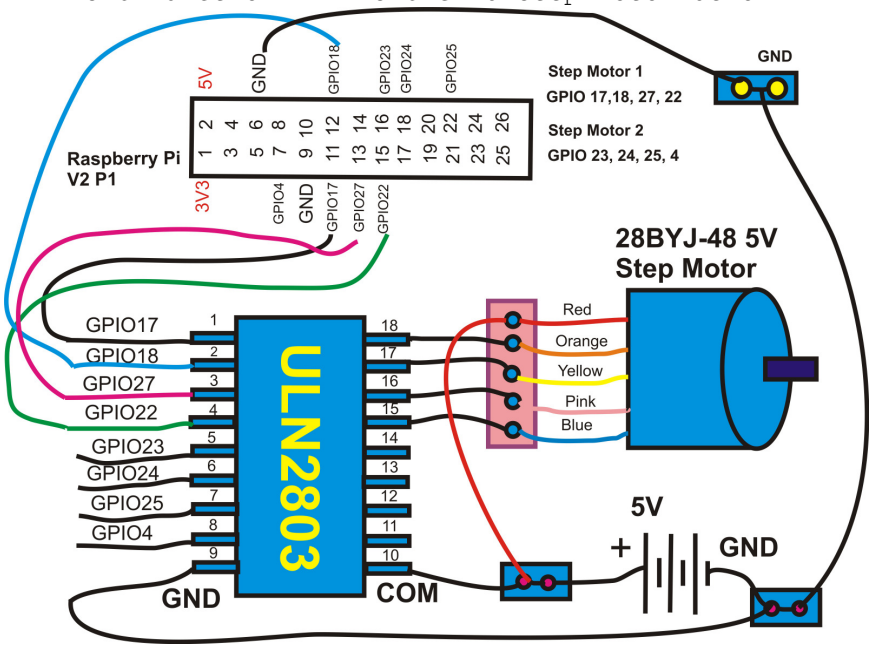
1. BASIC function 1 BASIC GPIO input & output demo



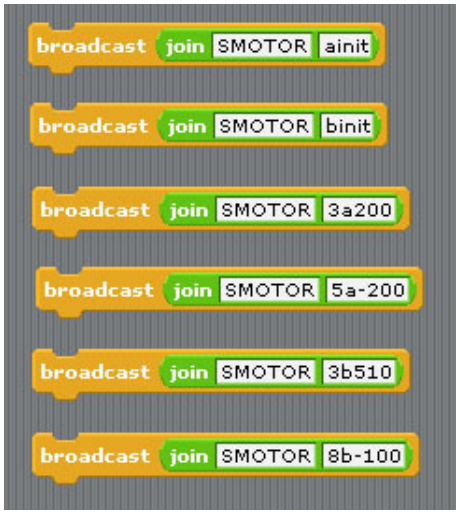
example Program RYG-LED-SW-demo.sb

1. define GPIO 23, 24 as input
2.define GPIO 4, 17,27 as output
3. press sw2 yellow LED on 1 sec, then Red LED "ON" The Cat say "Red"
4. press sw1 Red LED off 1 sec, then Green LED "ON" The Cat say "Green"





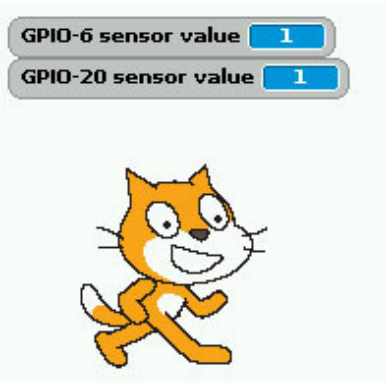
command "SMOTORainit" initial GPIO 17,18,27,22 as A Step Motor Port
command "SMOTORbinit" initial GPIO 23,24,25,7 as B Step Motor Port
command "SMOTOR" + speed (3-50) +(a or B) + output step
100 --- clockwise 100 step , -100 --- anticlockwise 100 step
a -- GPIO 17,18,27,22 , b -- GPIO 23,24,25,4

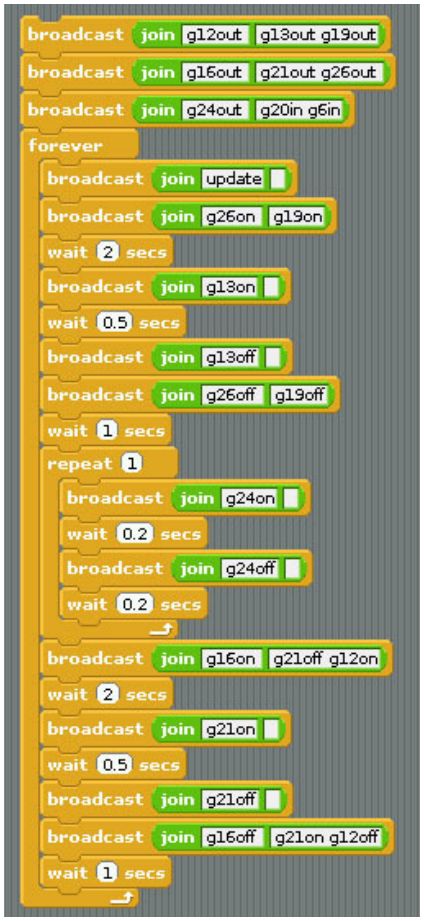


3. Raspberry Pi B+ (B Plus) EDU-v2 Learning Board support

first set traffic light Red (GPIO19), Yellow(GPIO13), Green (GPIO12) ,Switch 1(GPIO20)
second set traffic light Red (GPIO16), Yellow(GPIO21), Green (GPIO26) ,Switch 2(GPIO6)

1. **Setting GPIO 19,13,12 as output for R,Y,G LED**
2. **Setting GPIO 16,21,26 as output for R,Y,G LED**
3. **Setting GPIO 20,6 as input for 2 Switch**

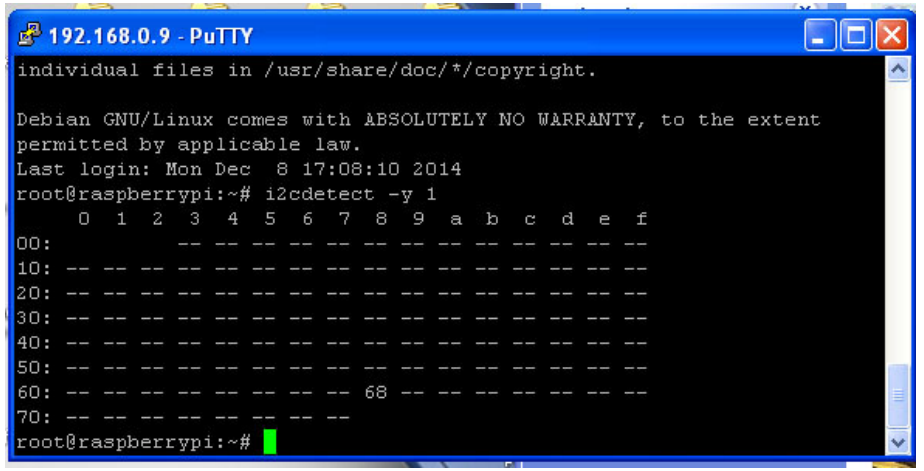


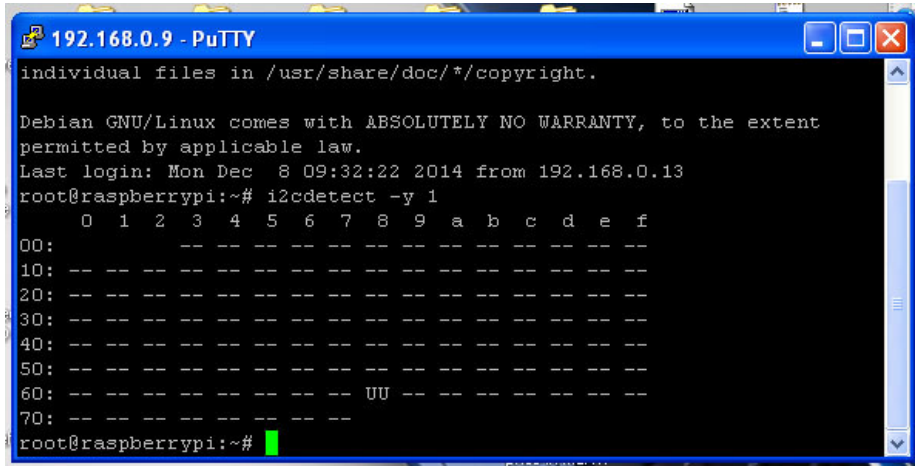


BASIC traffic light demo

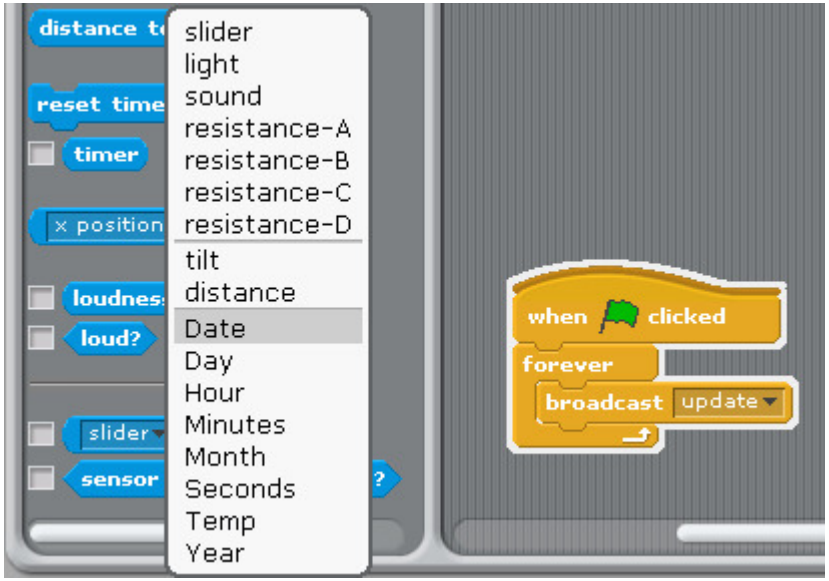
1. EDU Learning Board RTC setting

I2C DS1307 RTC 68 -> RTC DS1307



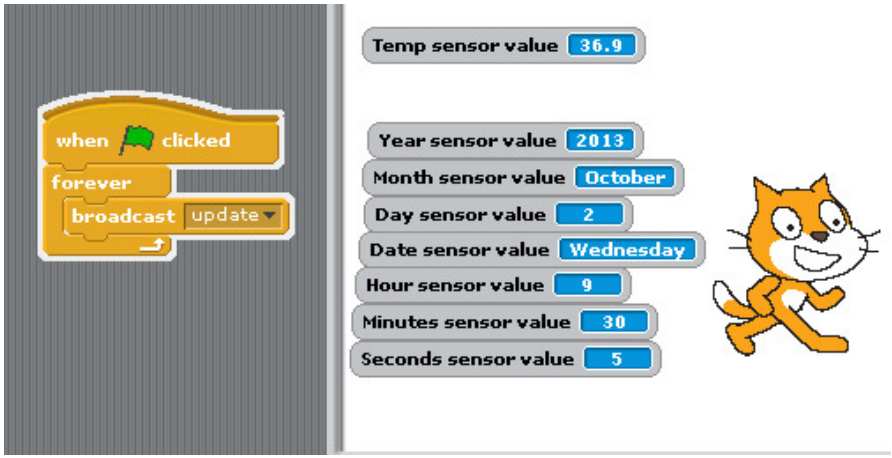


i2c address 68 DS1307 RTC detect & demo



after broadcast "Update" in Sensing --> Slider , you will see the RTC in the list

"Year, Month, Day, Date, Hour, Minutes, seconds"

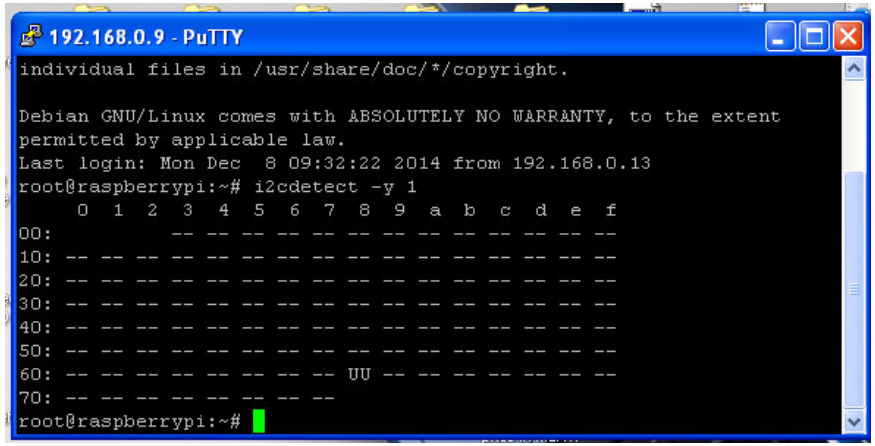


RTC information from Raspberry Pi i2c RTC module

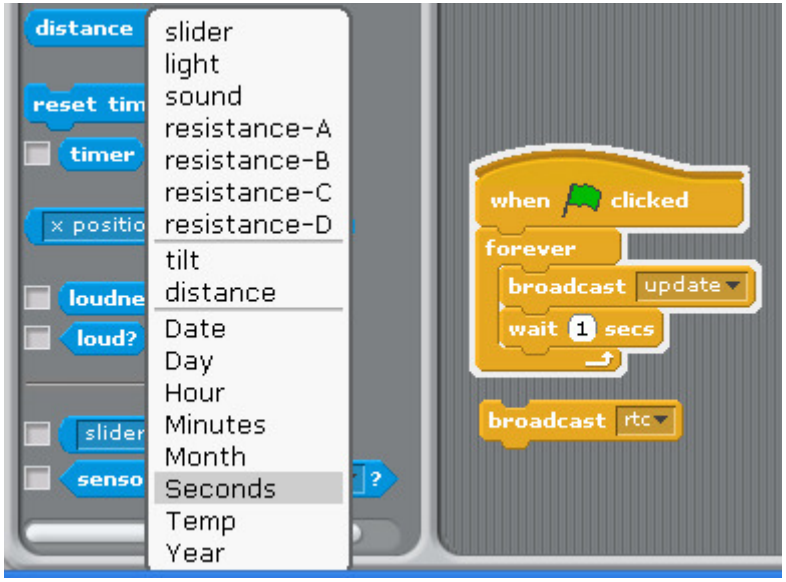
if you can't detect RTC function in Scratch

```
  GNU nano 2.2.6               File: /etc/rc.local

#
# By default this script does nothing.

# Print the IP address
_IP=$(hostname -I) || true
if [ "$_IP" ]; then
  printf "My IP address is %s\n" "$_IP"
fi

echo ds1307 0x68 > /sys/class/i2c-adapter/i2c-1/new_device

exit 0
```

you can add ds1307 in /etc/rc.local



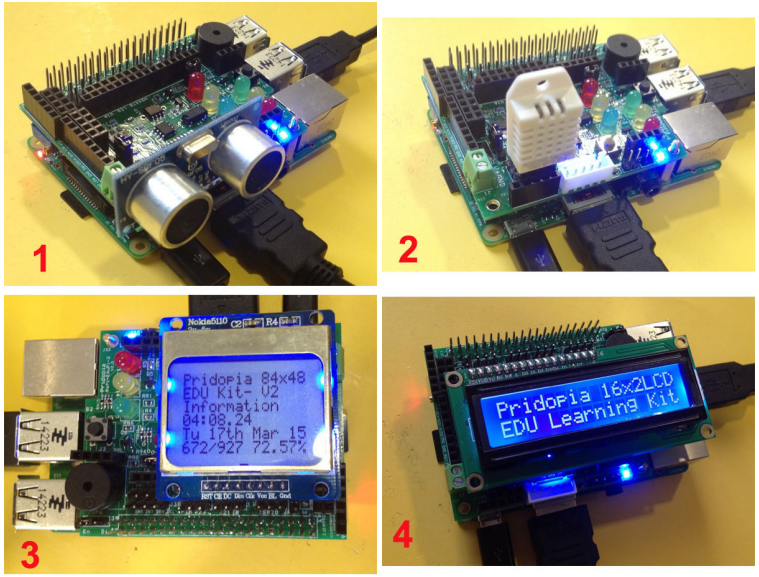
in 0x68 address display "UU"



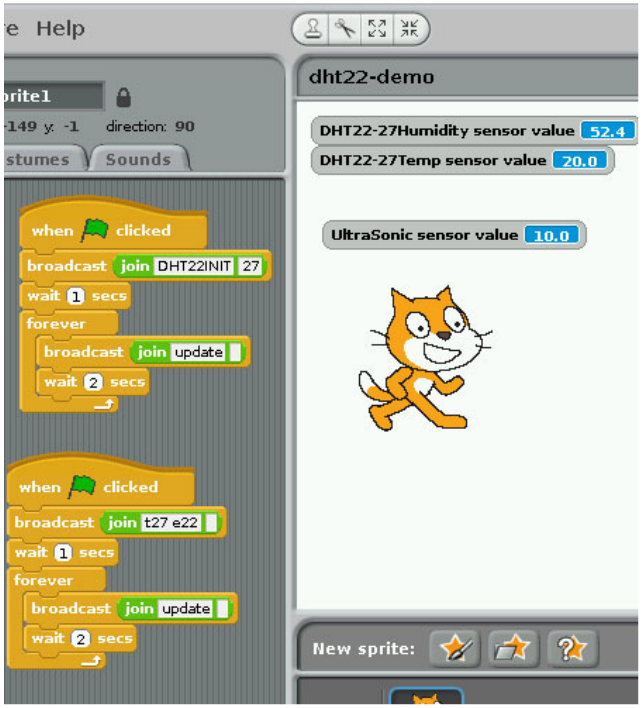
send broadcast "rtc" then broadcast "update"

after broadcast "Update" in Sensing --> Slider , you will see the RTC in the list

"Year, Month, Day, Date, Hour, Minutes, seconds"



1. Ultrasonic distance sensor
2. DHT22 Temperature & Humidity sensor
3. 84x48 Pixels Monochrome LCD
4. 16x2 character LCD



(1) DHT22/AM2302 Digital Temperature & Humidity Sensor

1.broadcast "DHT22INIT" +"27" GPIO number

in Sensing --> Slider , you will see the "DHT22-27Humidity" & "DHT22-27Temp" in the list

(2) Ultrasonic distance sensor (HY-SRF05) with 2channel Logic Level converter

Use two GPIO Trig(T) Echo(E)

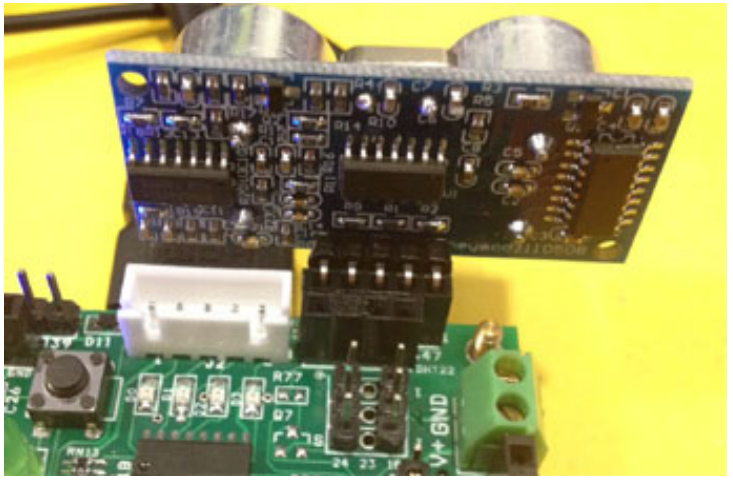
Update --> check distance and update

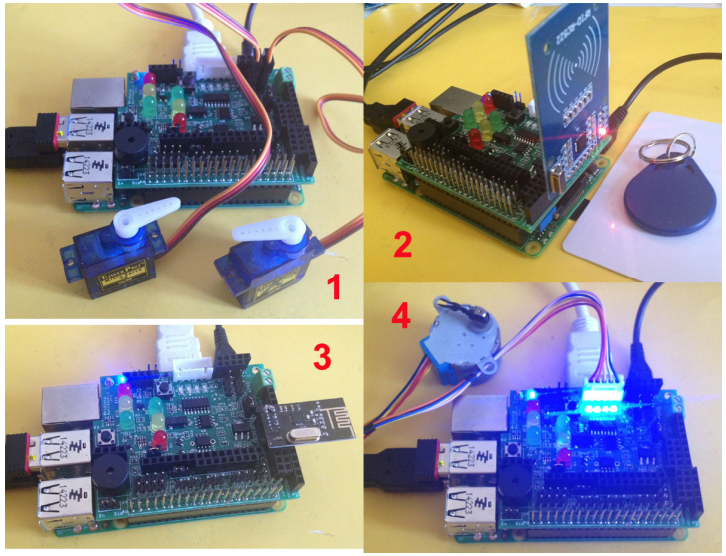
T27 --> Trig use GPIO27 E22 --> Echo use GPIO22

after broadcast "t27 e22 " & "Update"

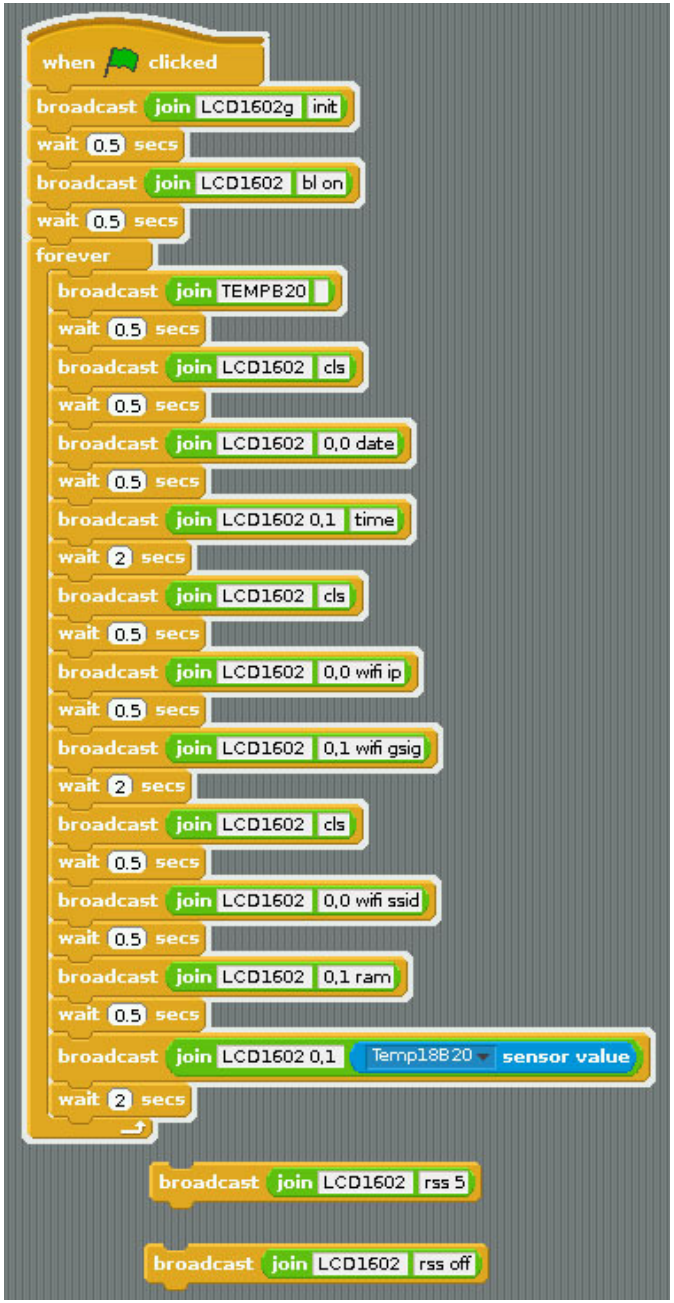
T27 Trig in GPIO27 E22 Echo in GPIO22

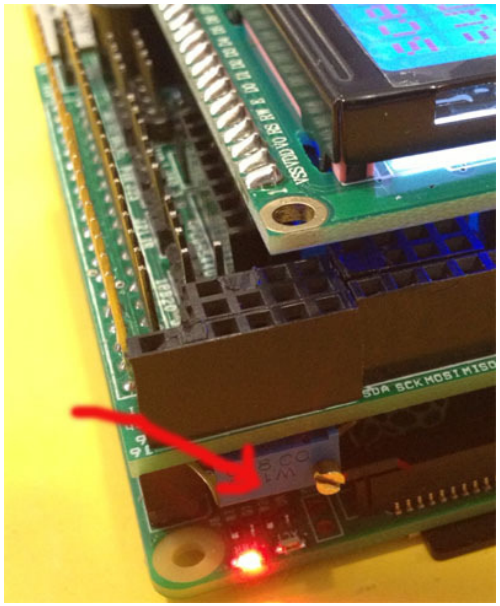
in Sensing --> Slider , you will see the " UltraSonic" in the list





1. 2 x SG90 Micro Servo
2. RFID Reader
3. NRF24L01 RF Module
4. 5V 28BYJ48 Step Motor





16x2 & 20x4 character LCD contrast adjust

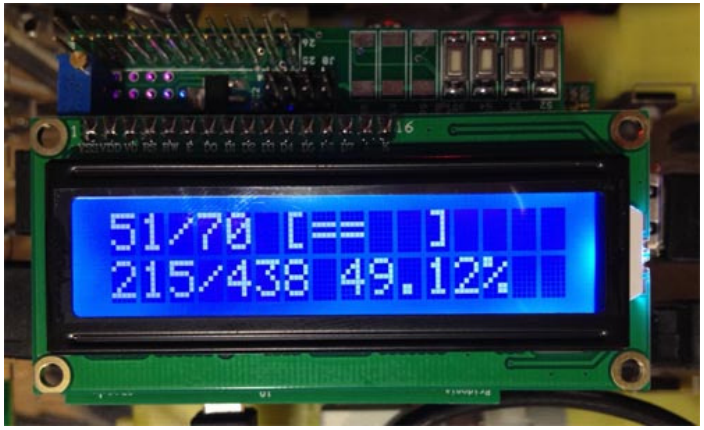
(6) **GPIO 16x2 LCD command**

command "LCD1602 " + "X , Y " + " ram" Display RAM usage in location x,y

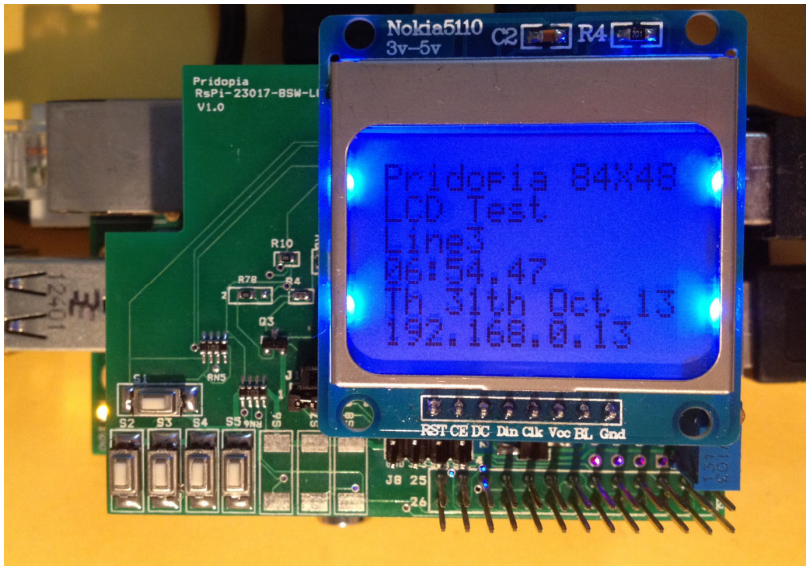
command "LCD1602 " + "X , Y " + " wifi" + " ip" Display WiFi IP in location x,y

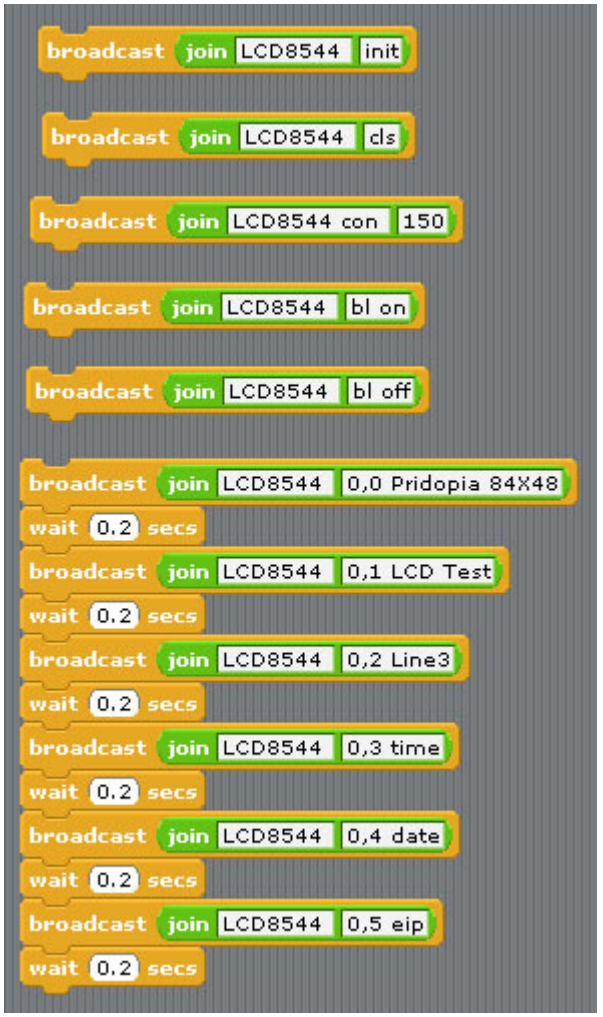
command "LCD1602 " + "X , Y " + " wifi" + " ssid" Display WiFi SSID in location x,y

command "LCD1602 " + "X , Y " + " wifi" + " gsig" Display wifi signal with bar chart in location x,y



84x48 pixels monochrome LCD





command "LCD8544 " + "init" initial 84x48 LCD

command "LCD8544 " + "con " + " (0 -255)" LCD contrast

command "LCD8544 " + "bl " + "on/off" LCD back light ON / OFF

command "LCD8544 " + "cls" clean screen

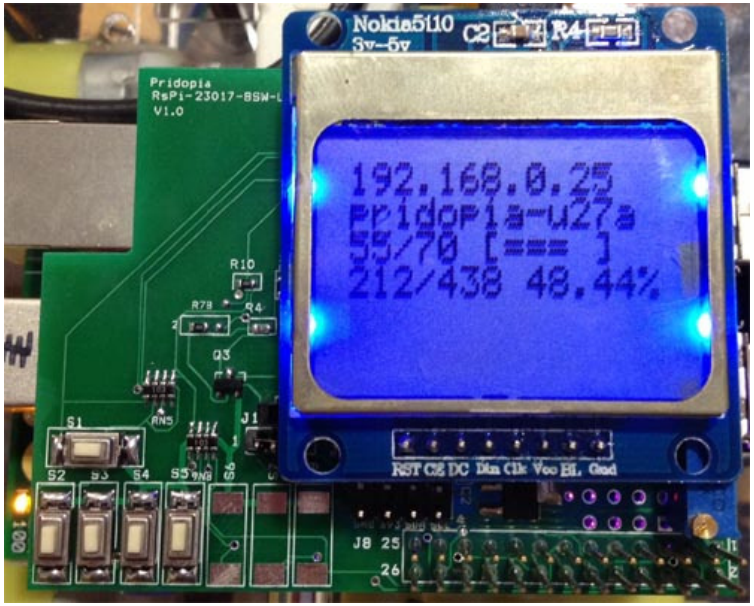
command "LCD8544 " + "X , Y " + " MESSAGE" Display message to LCD in location x,y

command "LCD8544 " + "X , Y " + " wip" Display WiFi IP to LCD in location x,y

command "LCD8544 " + "X , Y " + " eip" Display Ethernet IP to LCD in location x,y

command "LCD8544" + "X , Y " + " time" Display Time to LCD in location x,y

command "LCD8544 " + "X , Y " + " date" Display Time to LCD in location x,y

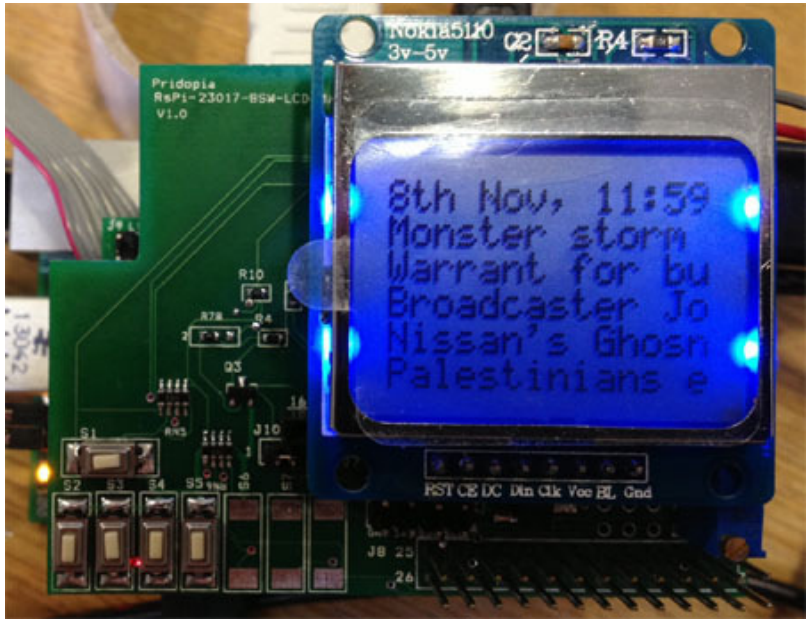


command "LCD8544 " + "X , Y " + " ram" Display RAM usage in location x,y

command "LCD8544 " + "X , Y " + " wifi" + " ip" Display WiFi IP in location x,y

command "LCD8544 " + "X , Y " + " wifi" + " ssid" Display WiFi SSID in location x,y

command "LCD8544 " + "X , Y " + " wifi" + " gsig" Display wifi signal with bar chart in location x,y



command "LCD8544 init" initial GPIO 84x48 LCD

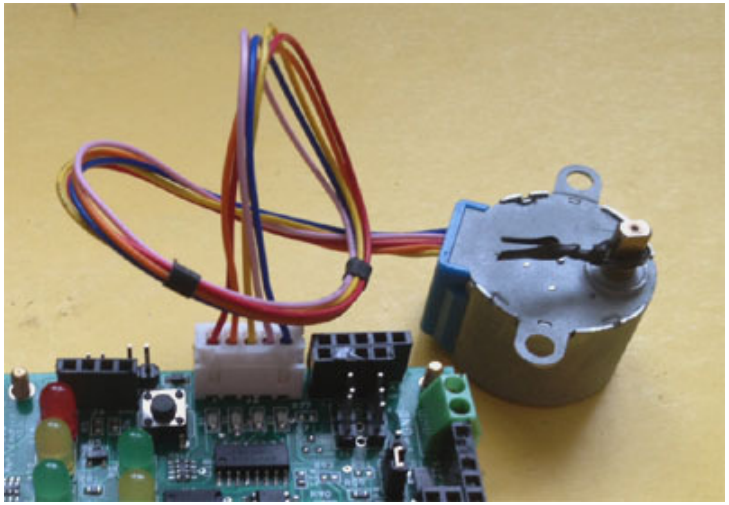
command "LCD8544 con 170" (0 -255)" LCD contrast

command "LCD8544 "rss"+ " speed" Active RSS function (need have internet)

LCD8544 rss 5 speed (1 to 20 - 1 is fast , 20 is slow)

command "LCD8544 rss off" stop RSS function

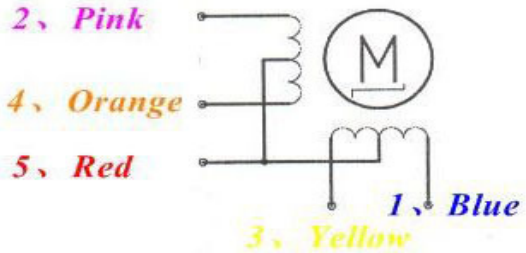
1. Stepper Motor



main program turn relay 1,on 2 off -> 1 off, 2 on on cycle

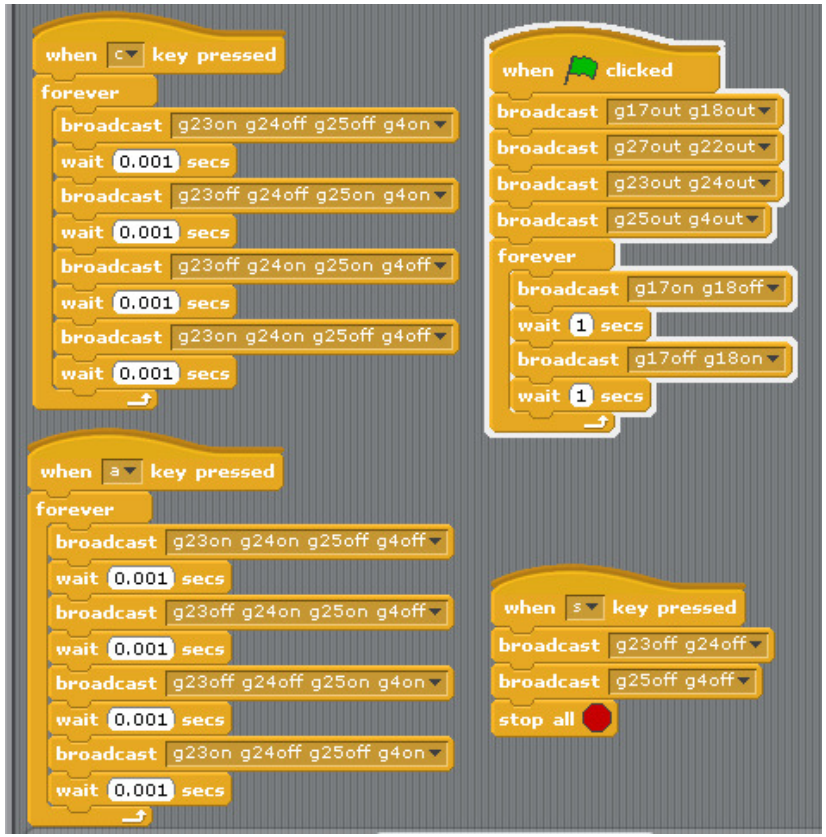
press C Stepper Motor clockwise press A Stepper Motor anticlockwise

Press S Stop



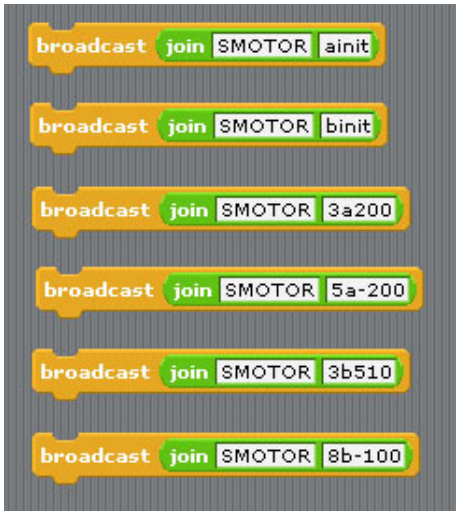
5V Step Motor

Lead Wire Color	---> CW Direction (1-2 Phase)							
	1	2	3	4	5	6	7	8
4 ORG	-	-						-
3 YEL		-	-	-				
2 PIK				-	-	-		
1 BLU						-	-	-

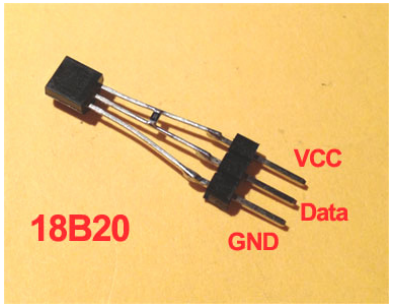


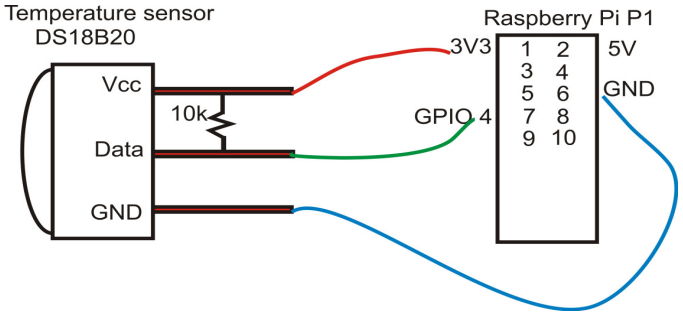
(2) Step Motor smotor command easy way

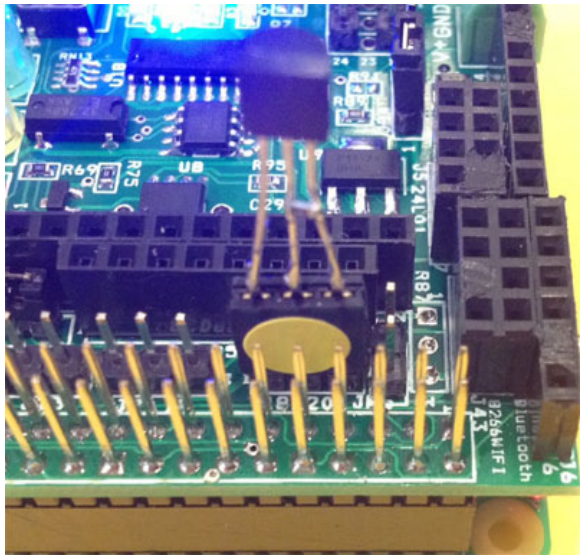
command "SMOTORainit" initial GPIO 17,18,27,22 as A Step Motor Port
command "SMOTORbinit" initial GPIO 23,24,25,7 as B Step Motor Port
command "SMOTOR" + speed (3-50) +(a or B) + output step
100 --- clockwise 100 step , -100 --- anticlockwise 100 step
a -- GPIO 17,18,27,22 , b -- GPIO 23,24,25,4



3. 1-Wire 18B20 temp Sensor

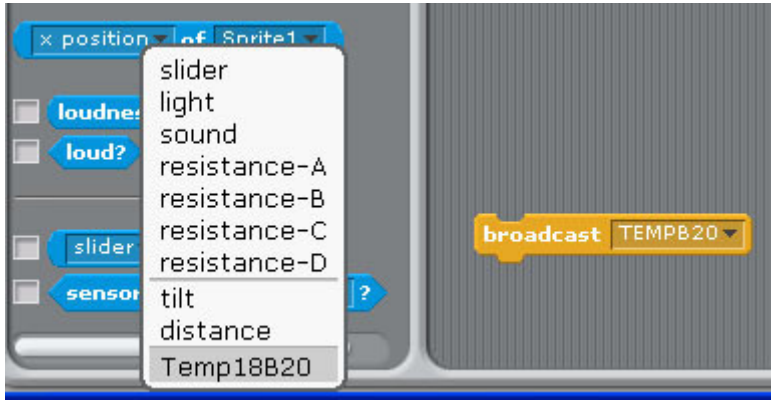






VCC to 3.3V P1 pin1, Data to P1 pin7(GPIO4) , GND to P1 pin6(GND)

Data & VCC we have one 10K SMD Resister

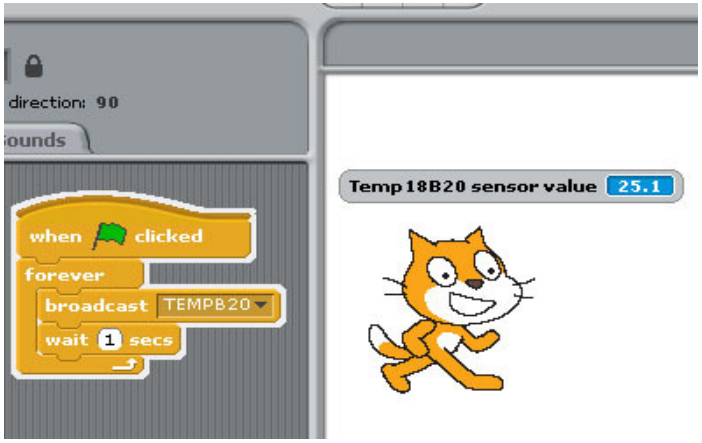


Command " TEMPB20" to active 1-wire in pin7(GPIO4)

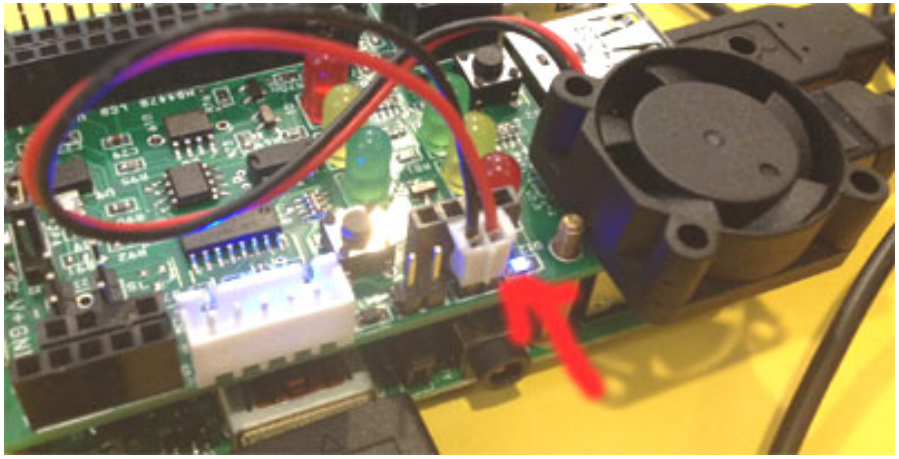
1.broadcast ""TEMPB20"

2. after broadcast in Sensing --> Slider ,

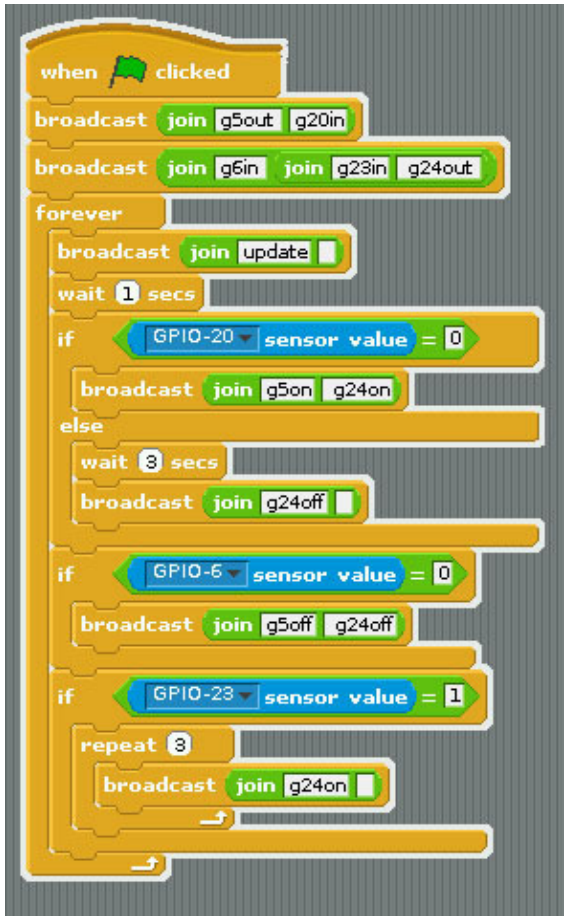
you will see the " Temp18B20" in the list



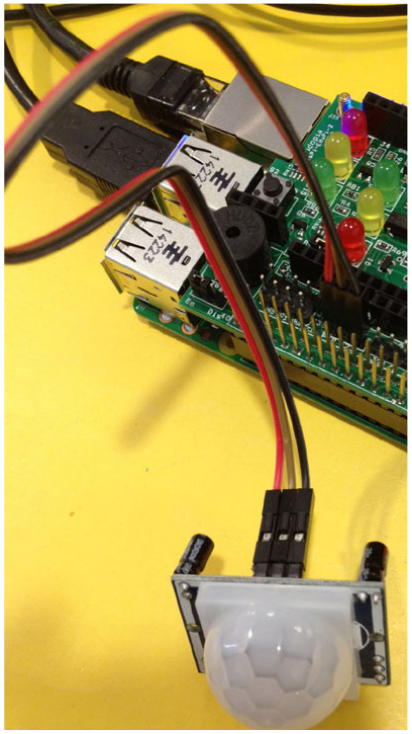
4. DC 5V MINI FAN control (GPIO5)

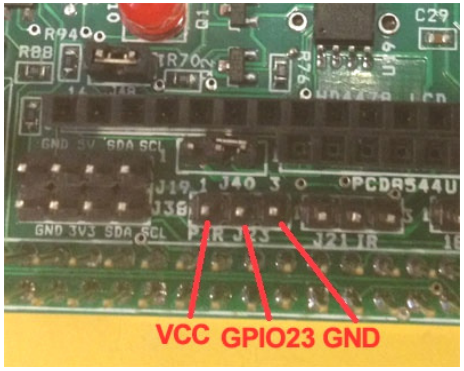


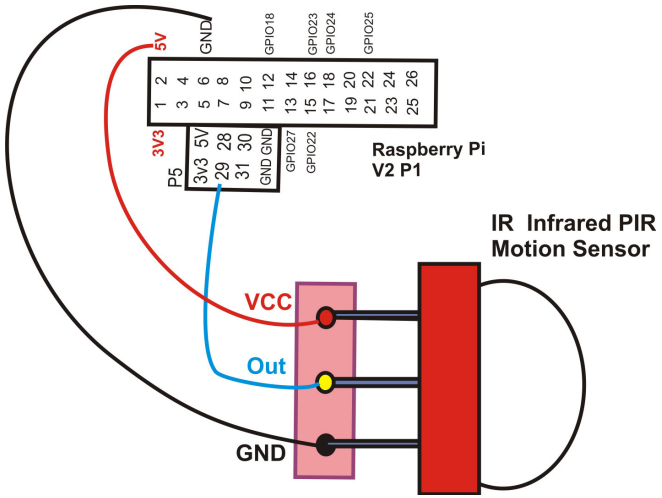
1. broadcast "g5" + "out" setting GPIO 5 as output for Mini Fan
   broadcast "g20" + "in" setting GPIO 205 as Micro Switch input
2. broadcast "update"
3.in Sensing --> Slider , you will see the "GPIO-20" in the list

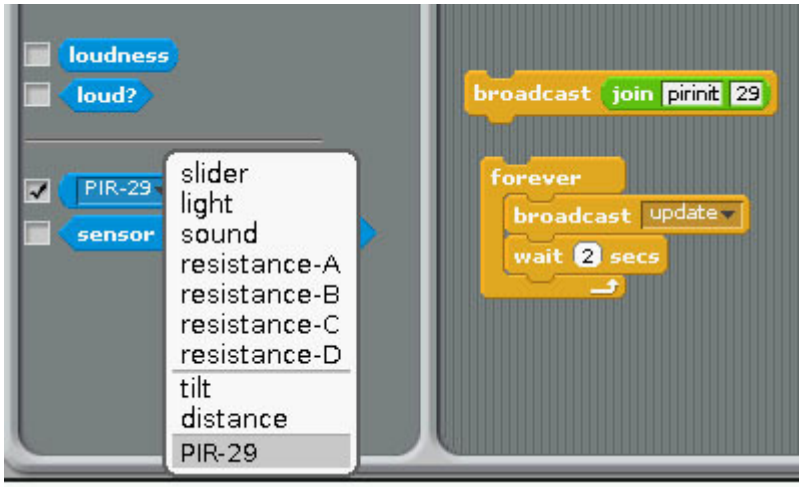


5. IR PIR Motion Sensor Module (GPIO23)



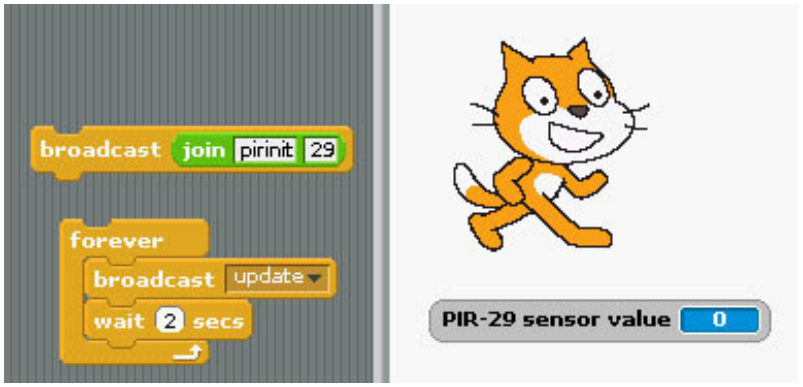






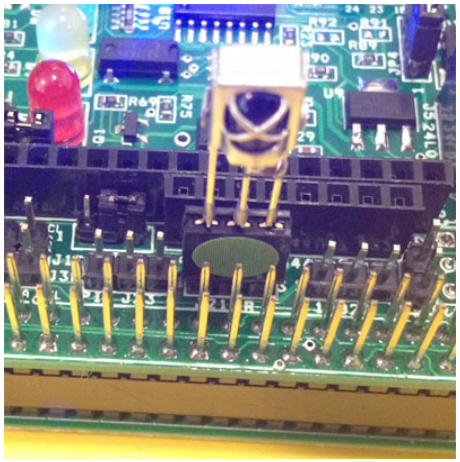
1.broadcast "pir" + "init" + "29" GPIO 29 as input

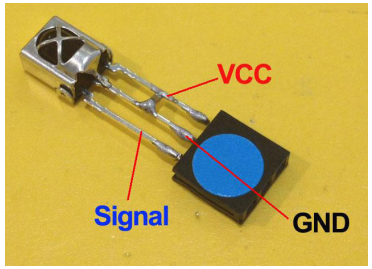
2.in Sensing --> Slider , you will see the "PIR-29" in the list

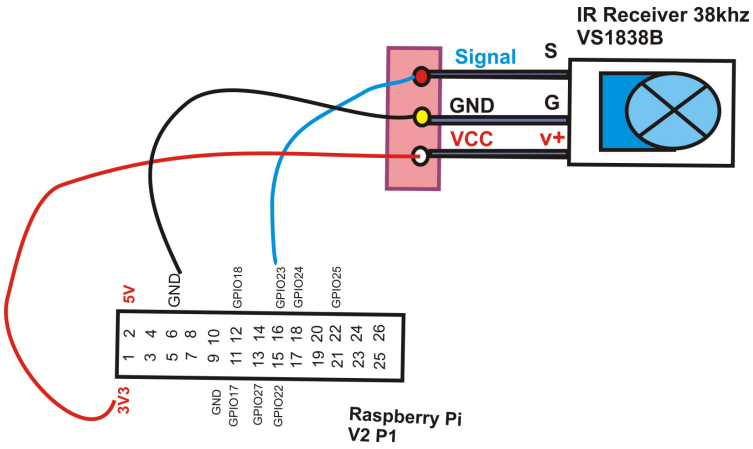


The PIR -29 value change between "0" & "1"

6. IR remote control (GPIO23)

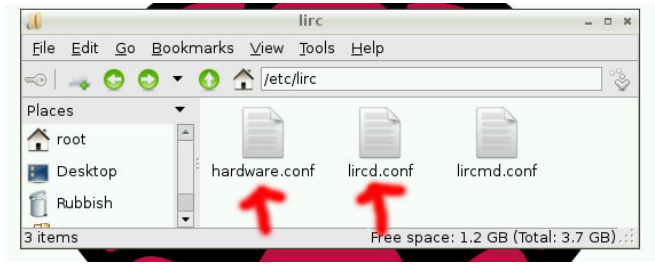




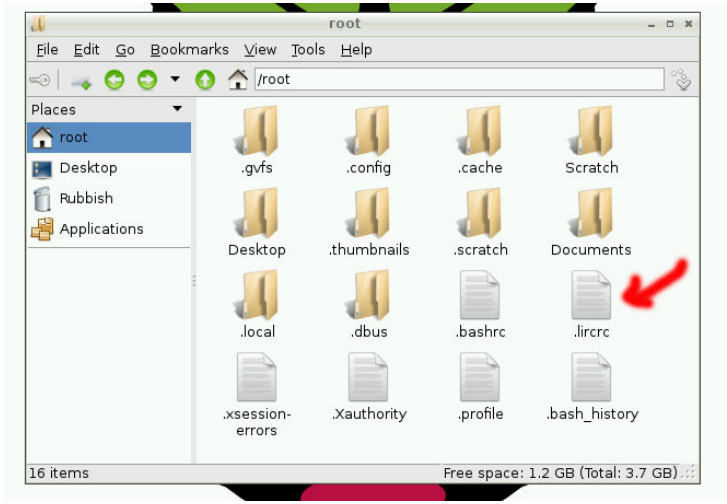


Download 3 Remote control setting files

lircd.conf .lircrc hardware.conf

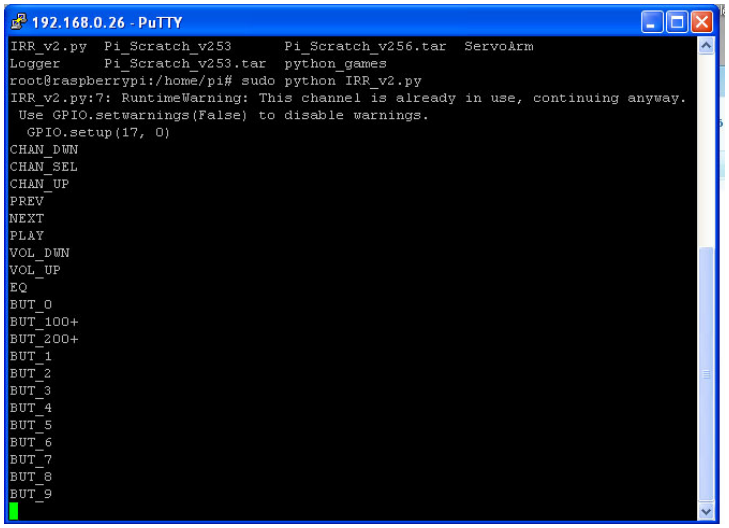


Copy hardware.conf , lircd.conf & lircrc to /etc/lirc

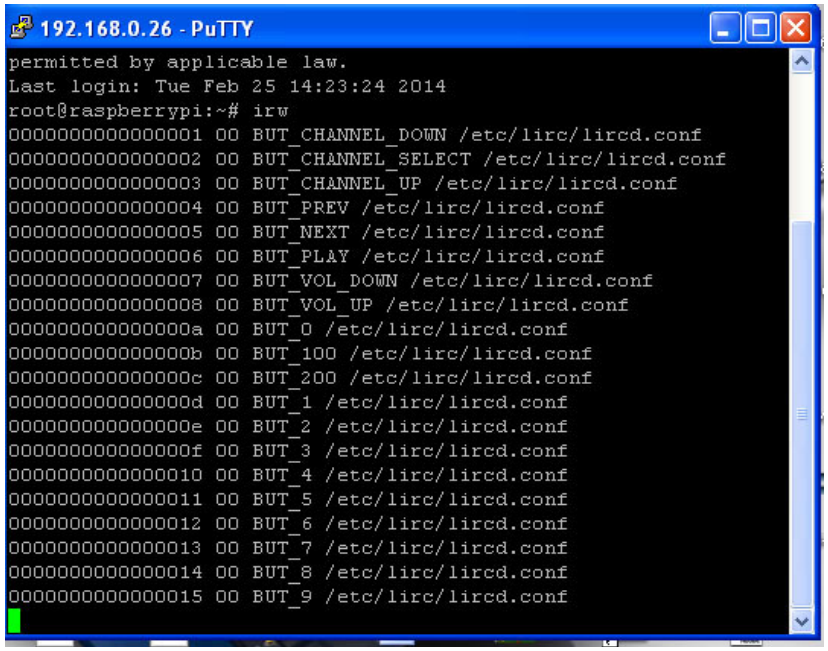


Copy .lircrc to /root

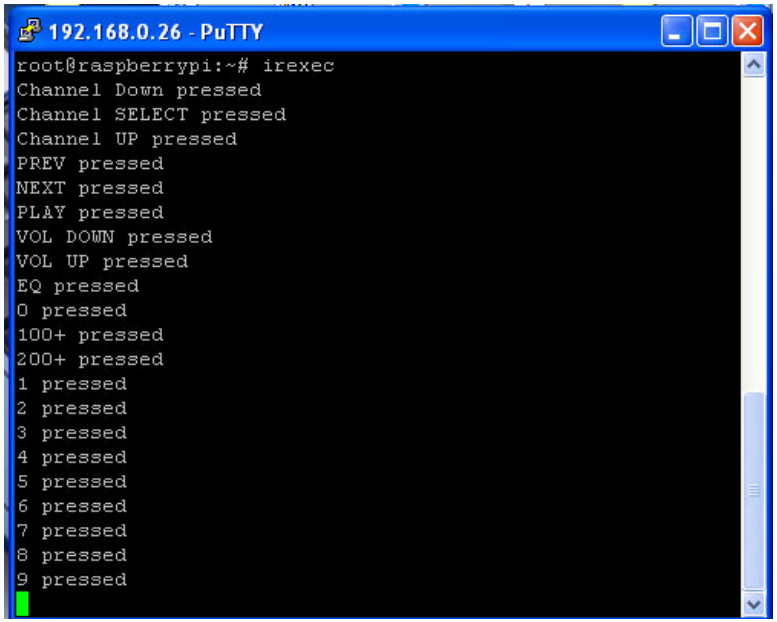
Remote control example



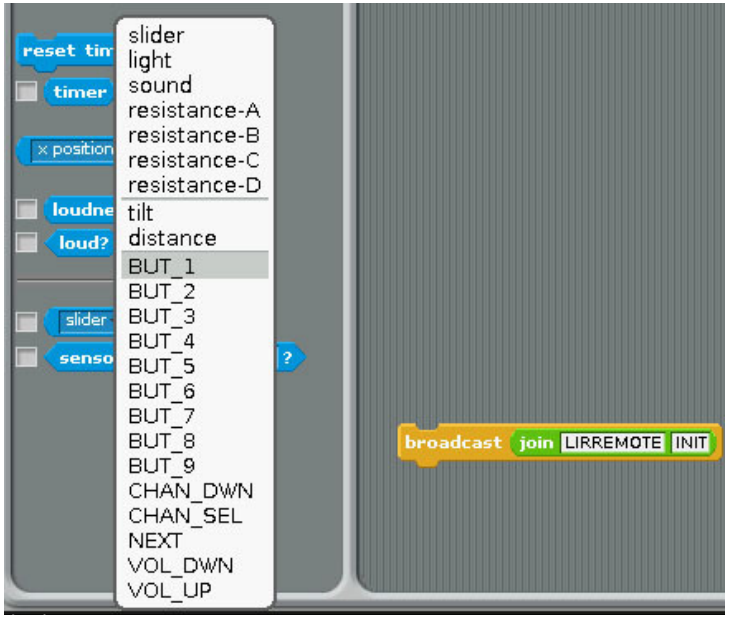
IRR_v2.py demo



irw read information from remote control



irexec read information from remote control



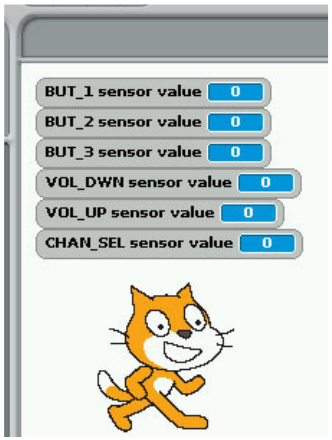
Scratch setting demo

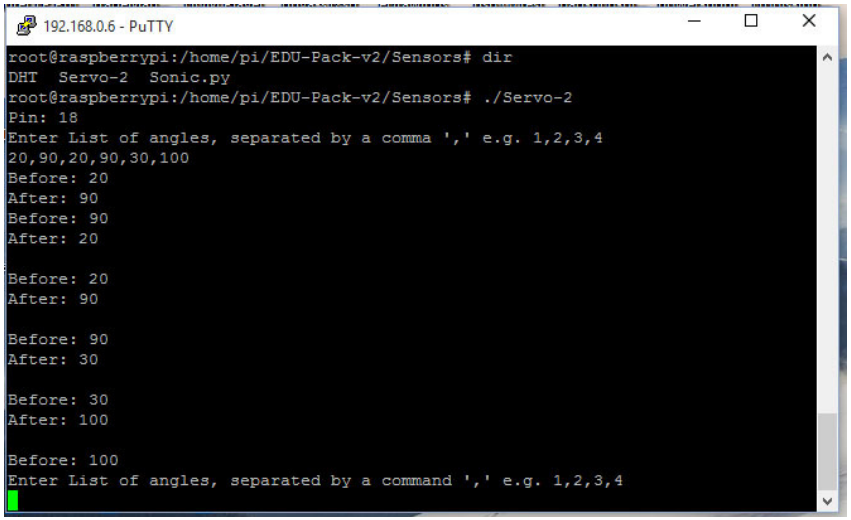
Command " LIRREMOTE" +"INIT" to active IR REMOTE CONTROL

1.broadcast "LIRREMOTEINIT"

2. after broadcast Press the key in remote control you want use in Scratch

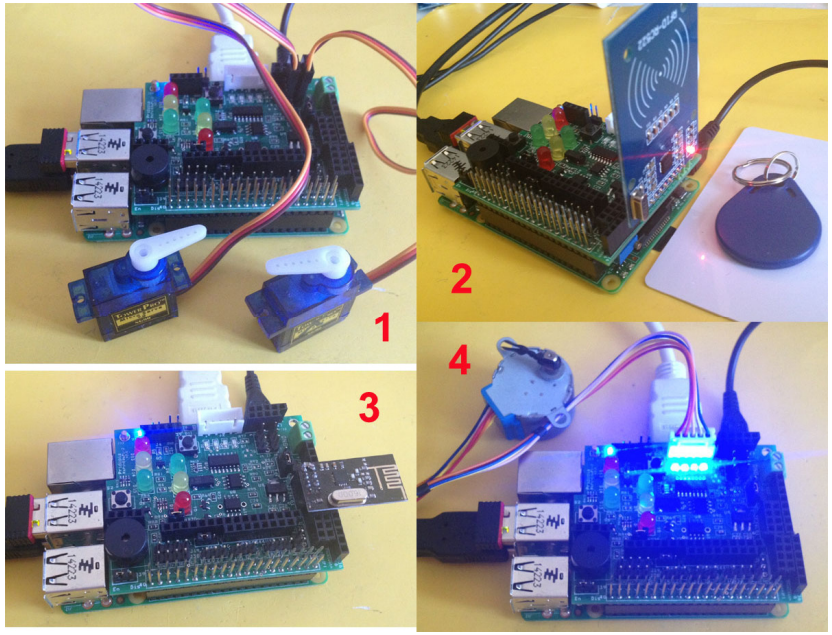
in Sensing --> Slider , you will see the key you press in the list



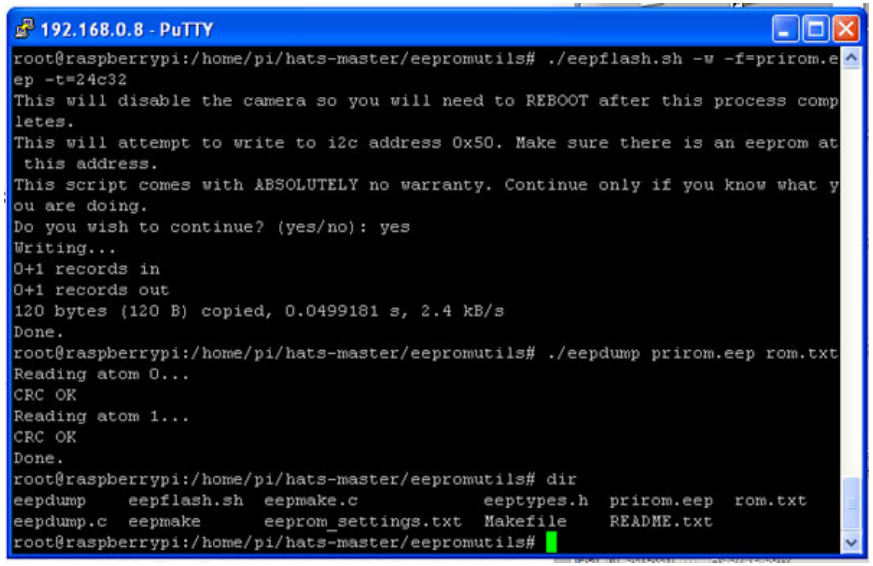


Servo-2 demo program

In EDU-Pack-v2/Sensors ./Servo-2

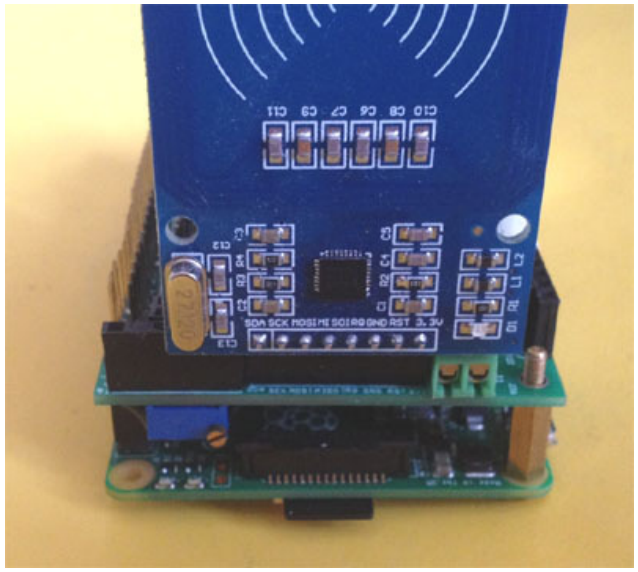


1. 2 x SG90 Micro Servo
2. RFID Reader
3. NRF24L01 RF Module
4. 5V 28BYJ48 Step Motor



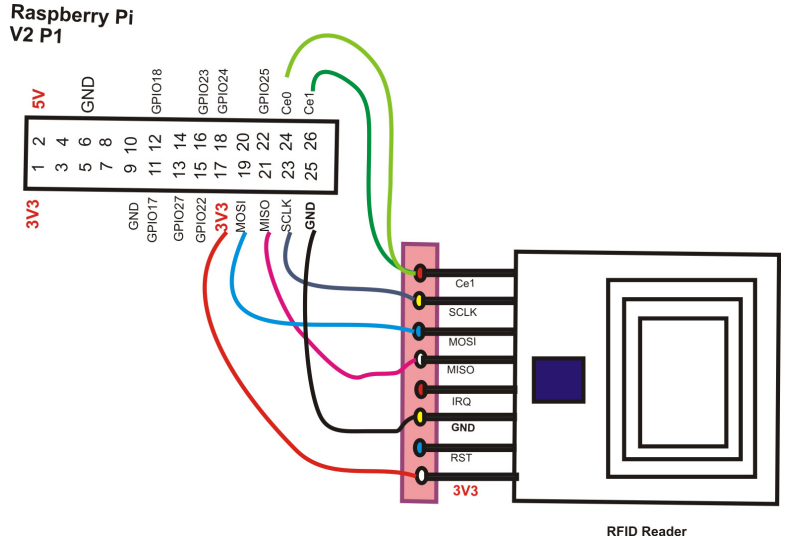
HAT EEPROM read/write demo

7. RFID reader (SPI signal)

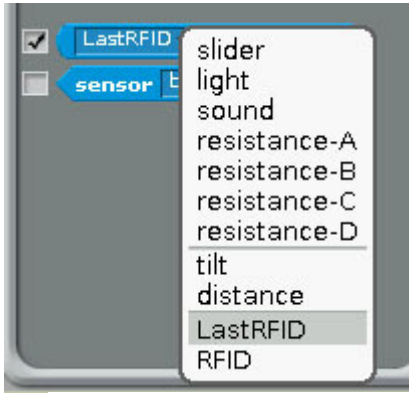


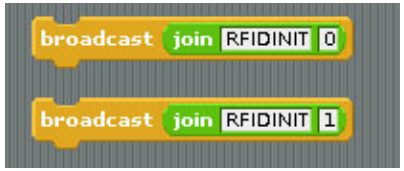
RFID socket
From pin1 (SDA,SCK,MOSI,MISO,IRQ,GND,RST,3V3

(1) GPIO (SPi) RFID Reader & GPIO Relay output



Scratch control demo



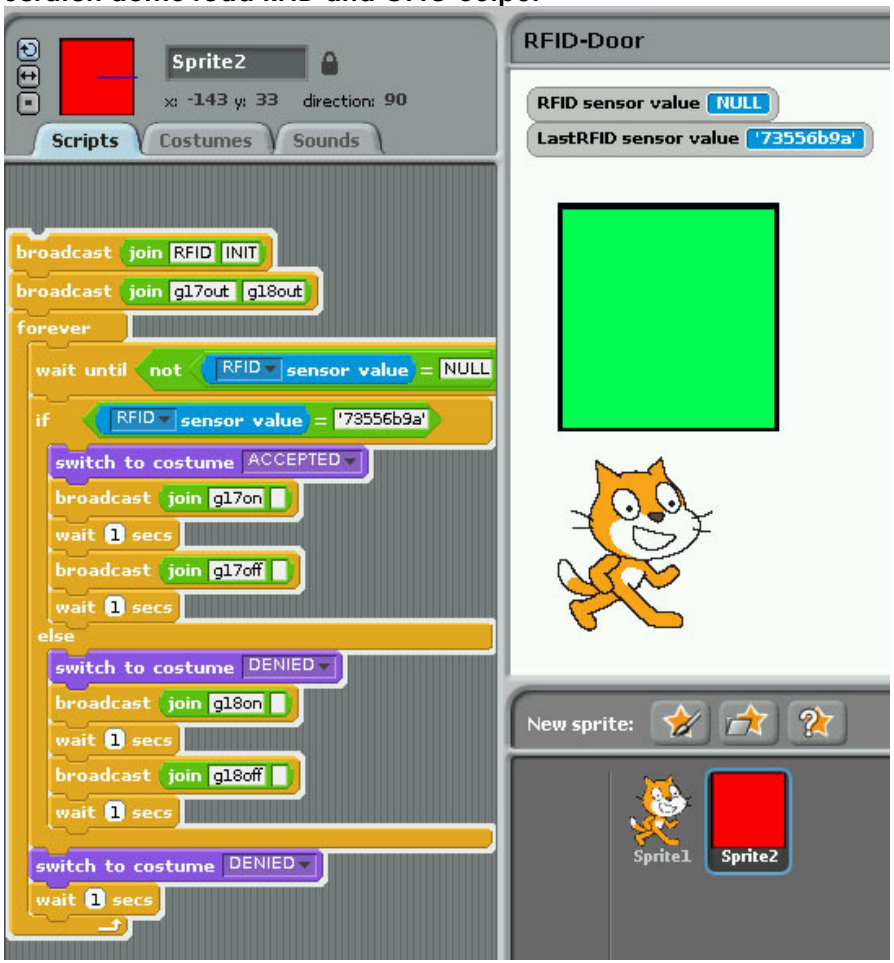


1) **Command "RFID"+"INIT"+"0" for CE0**
or Command "RFID"+"INIT"+"1" for CE1

will initial SPI signal to active RFID Reader

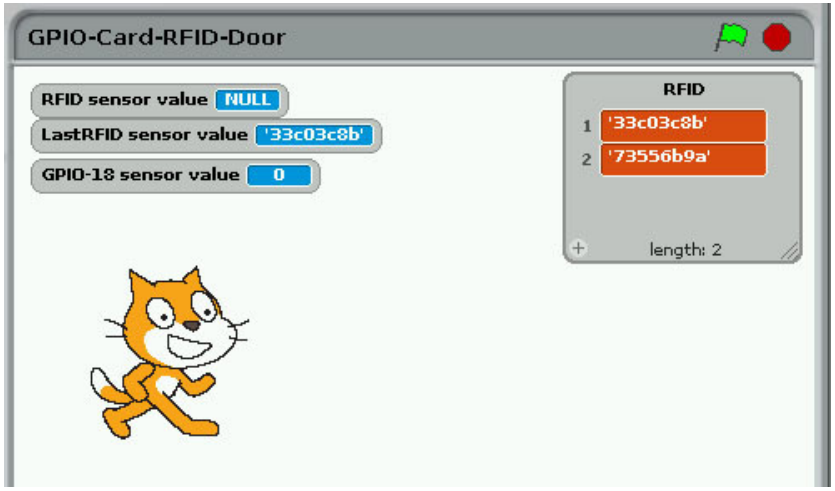
2) **you will see "LastRFID" & "RFID" in Sensors**

Scratch demo read RFID and GPIO output



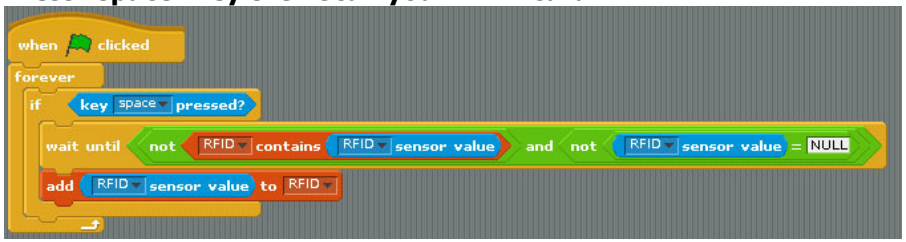
RFID reader & Relay & Step Motor control

scratch demo code

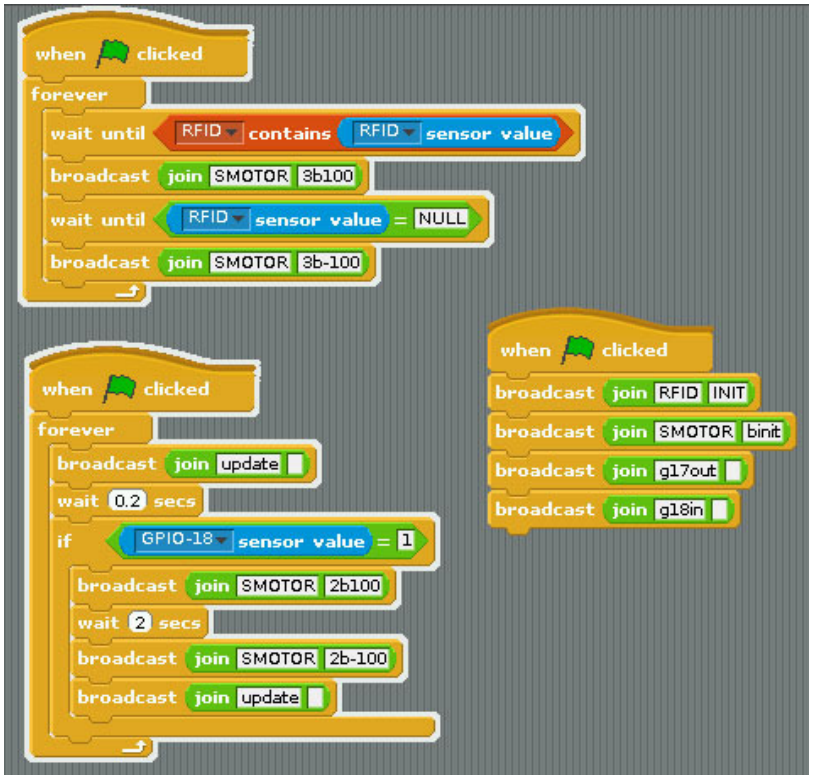


ADD RFID Card into data base

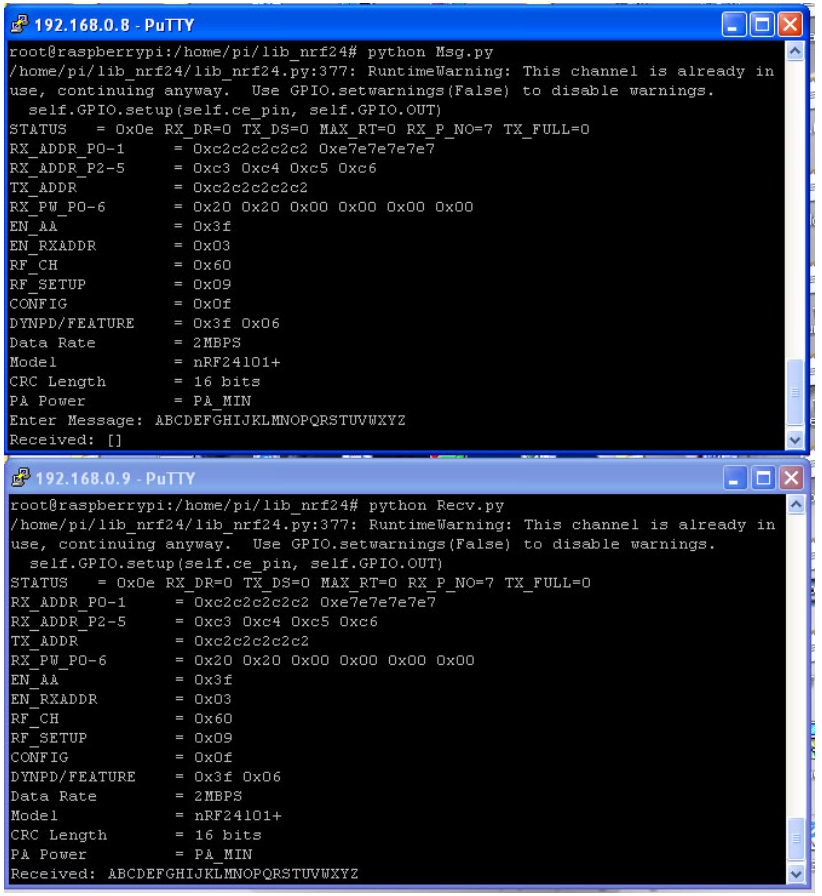
Press "space" key then scan your RFID card



Active with Step Motor and GPIO Switch input



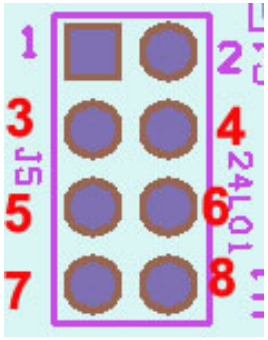
14. NRF24L01 Radio Frequency Reader module (SPI signal)

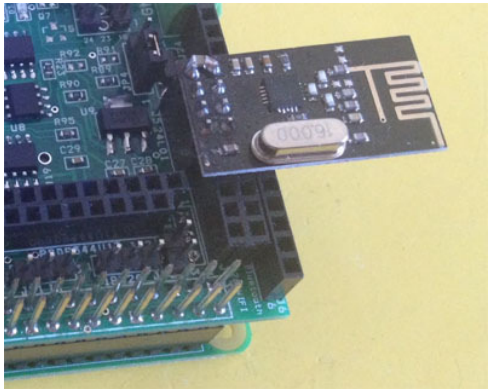


NRF24L01 RF module demo -- provide python program send message , need two of Pi , one use Mes.py one use Recv.py

NRF24L01 socket

From pin1 (GND,3V3,GPIO25,CE0,SCLK,MOSI,MISO,X)



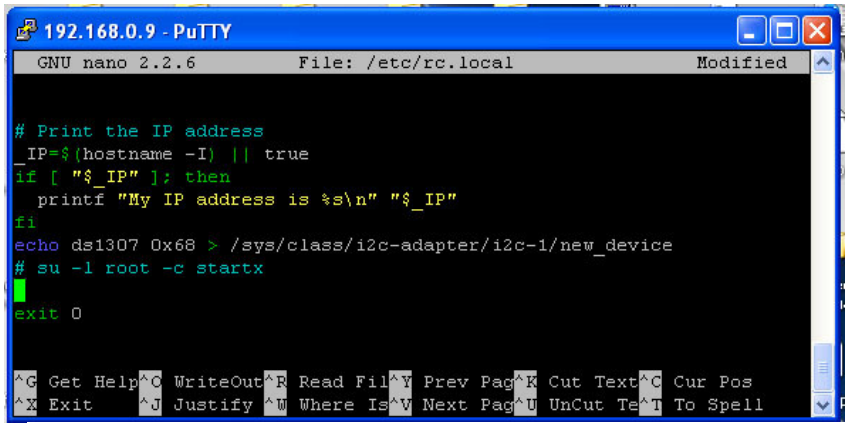


For test NRF24L01 module you need

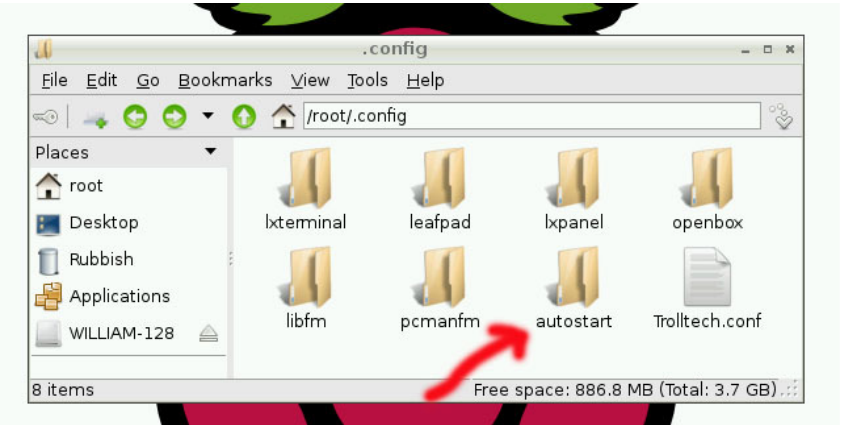
Sudo nano /etc/rc.local

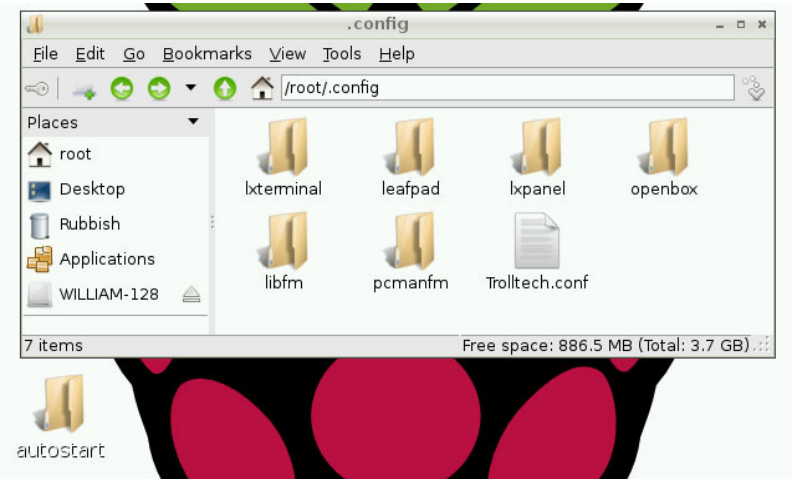
Put # in front of su -l root -c startx

Or Or move "autostart" folder from /root/.config to desktop

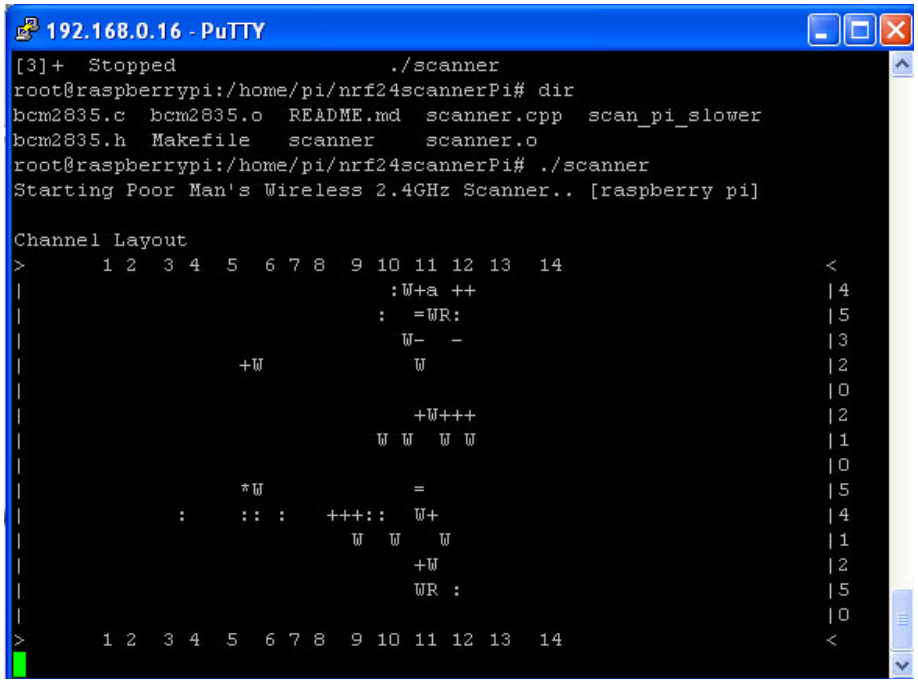


Or move "autostart" folder from /root/.config to desktop



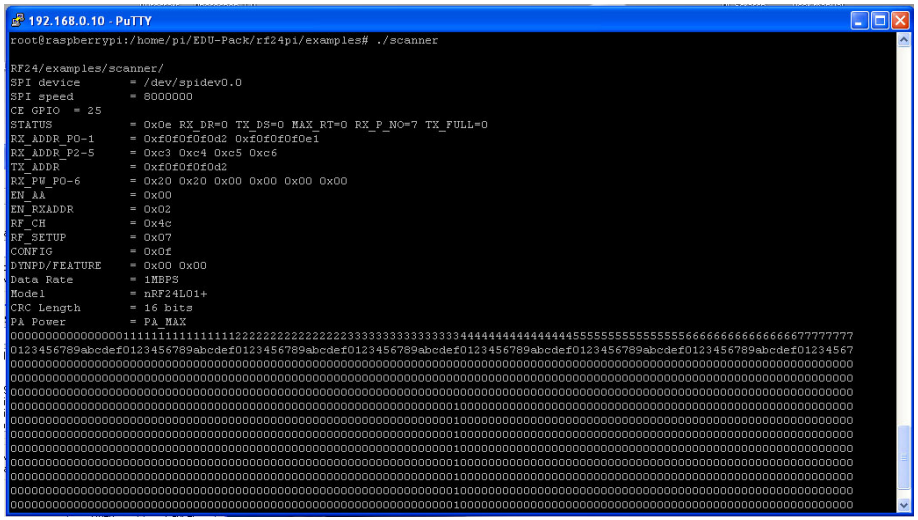


In "nrf24scannerPi" folder WiFi scanner test program

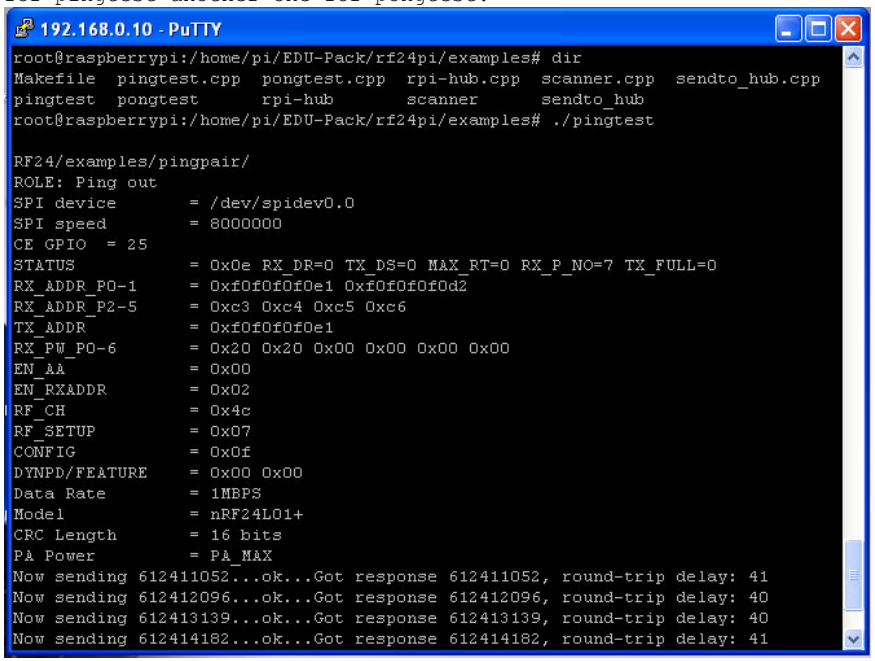


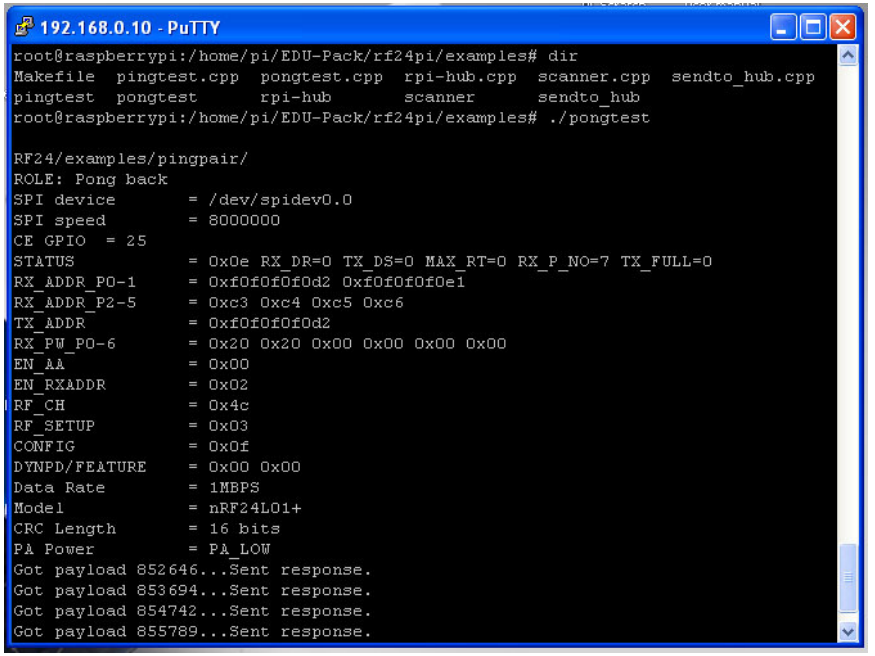
In "rf24pi" folder examples folder

Use chmod +x scanner , chmod +x pingtest , chmod +x pongtest

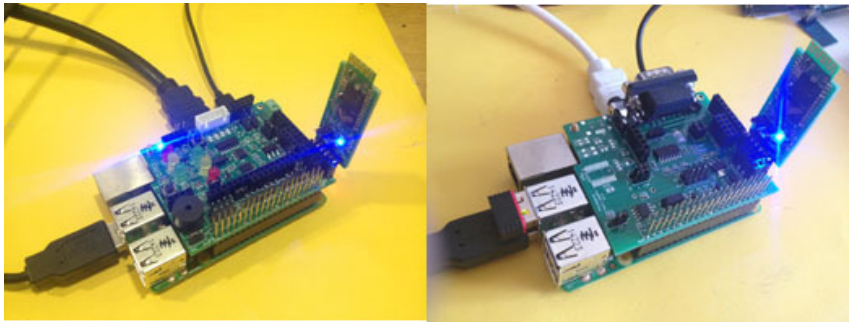


The pingtest & pongtest need 2 of Pi & 2 set of NRF24L01 Module , one for pingtest another one for pongtest.

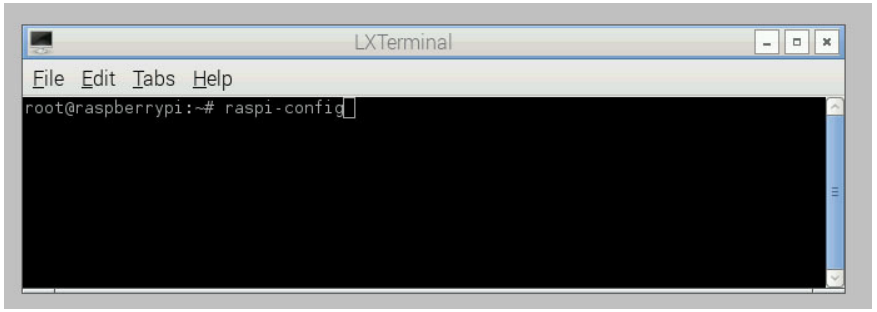




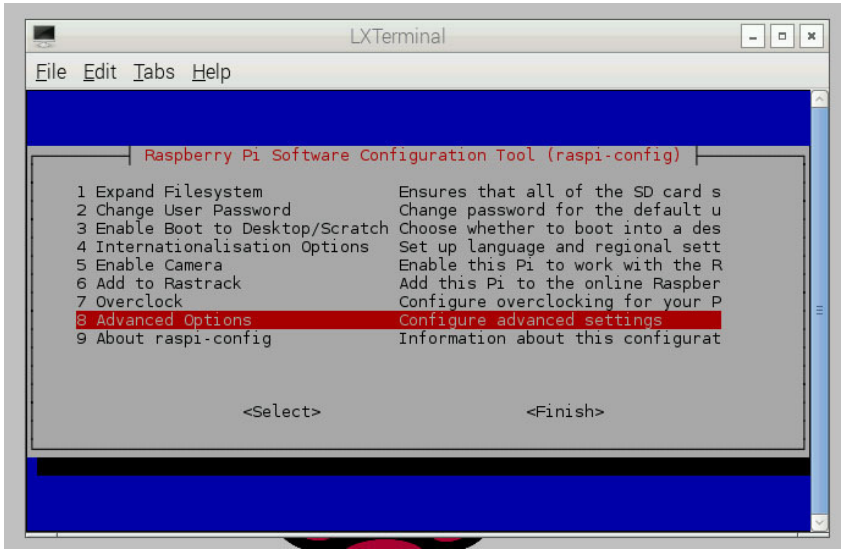
EDU-V2-E01 & E02 - BlueTooth 2.0 console setting



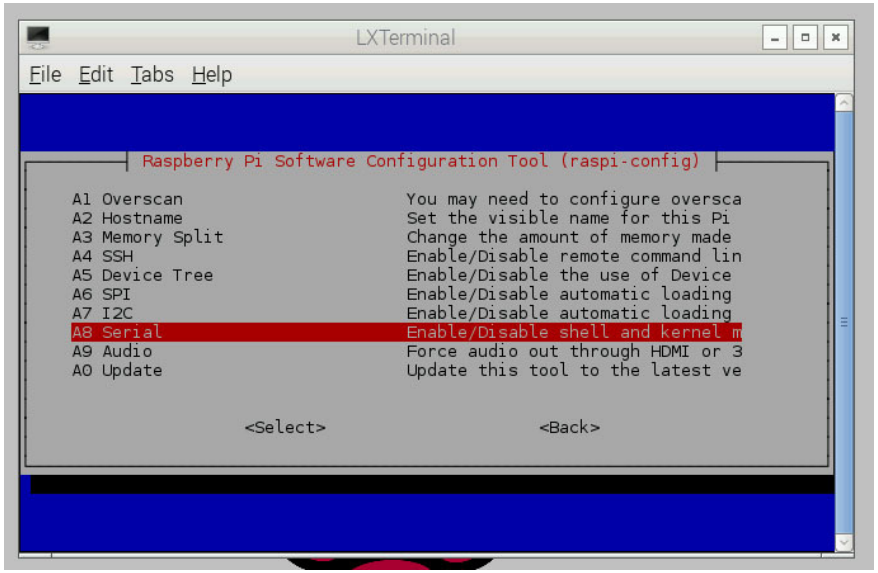
change the setting to enable serial console port



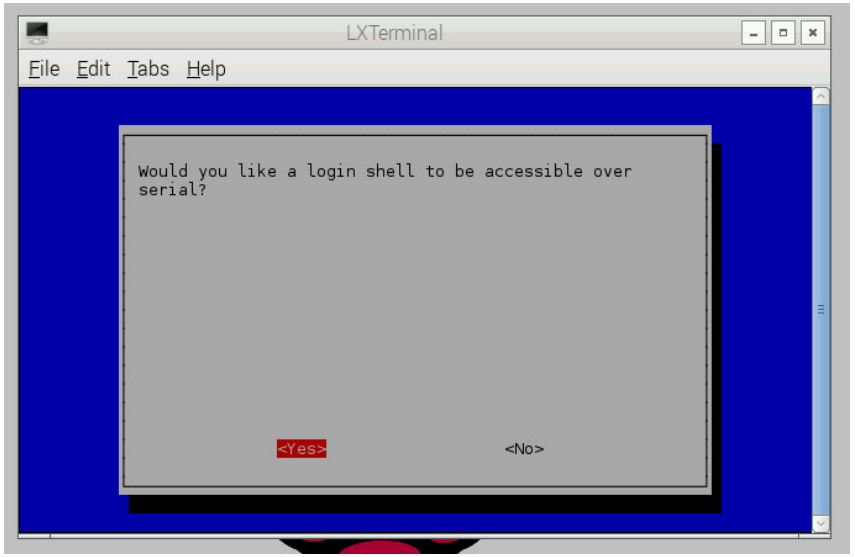
type **raspi-config in LXTerminal**



choose **Advanced options**



choose **Serial Enable/disable shell and kernel**



choose "**Yes**" for serial console function

and

1. Pi Setting serial console port for bluetooth

Step 1. Modify the inittab File:

At a terminal command prompt issue this command:

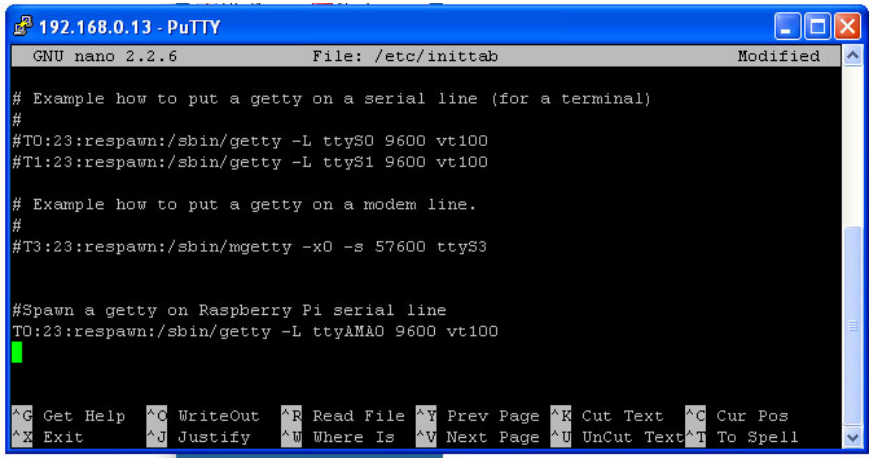
sudo nano /etc/inittab

Look near the end of the file and find the lines that look like this:

#Spawn a getty on Raspberry Pi serial line
T0:23:respawn:/sbin/getty -L ttyAMA0 115200 vt100

change to

#Spawn a getty on Raspberry Pi serial line
T0:23:respawn:/sbin/getty -L ttyAMA0 9600 vt100



Step 2.

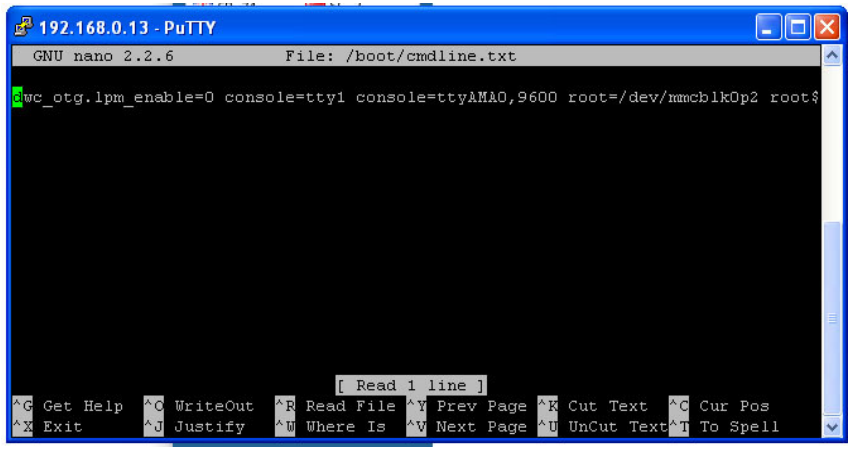
sudo nano /boot/cmdline.txt

The entire contents of the file look like this:

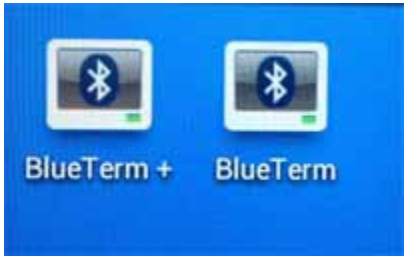
dwc_otg.lpm_enable=0 console=ttyAMA0,115200 kgdboc=ttyAMA0,115200 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait

change to

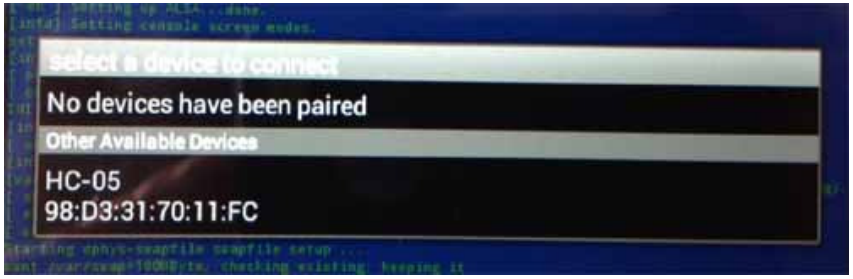
dwc_otg.lpm_enable=0 console=ttyAMA0,9600 kgdboc=ttyAMA0,9600 console=tty1 root=/dev/mmcblk0p2 rootfstype=ext4 elevator=deadline rootwait



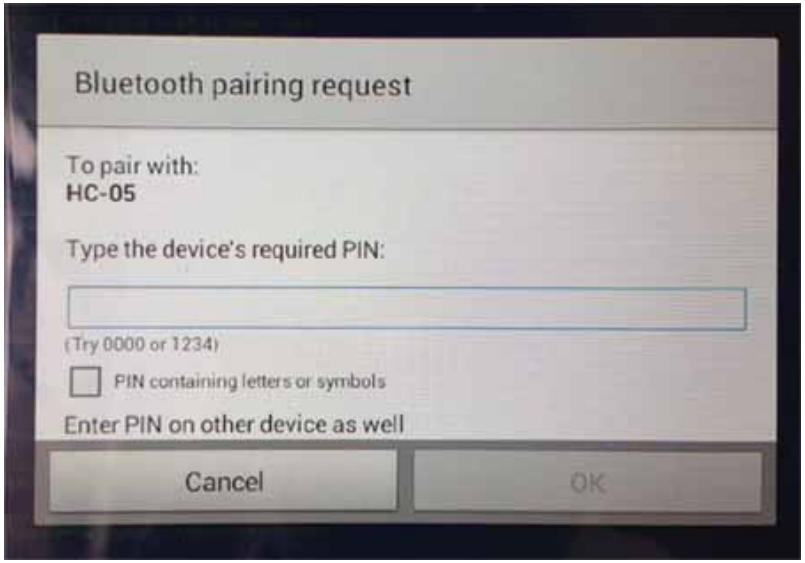
Step 3 .Bluetooth setting for console port



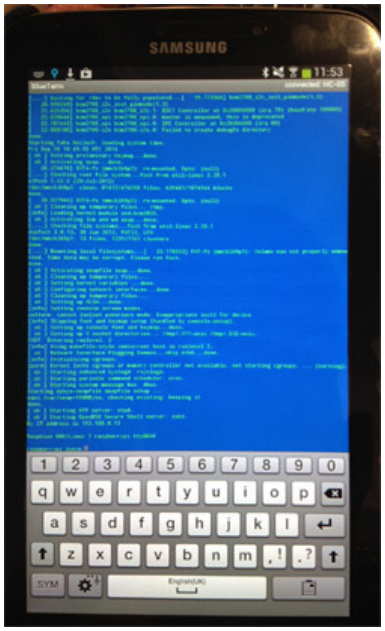
use Android Tablet BlueTerm+ or BlueTerm



find "HC-05" bluetooth device



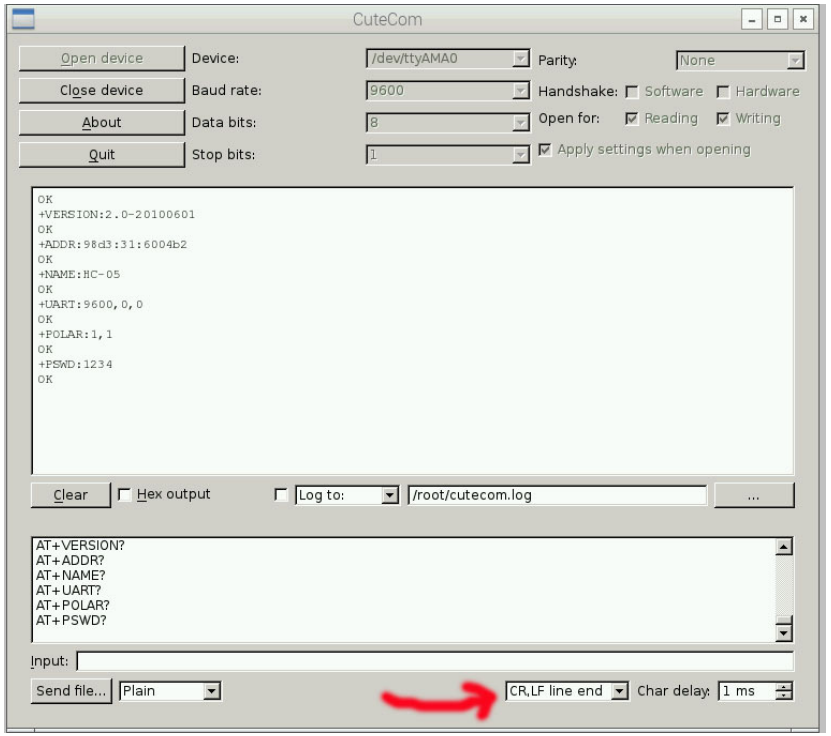
input pin "1234" for pair



you will see raspberry pi boot from Android Tablet screen

B2 LED flashing, B1 always On

***** AT command in CuteCom for Bluetooth 2.0/4.0 BLE (for EDU-V2-E01 & EDU-V2-E02)**



Bluetooth v2.0 HC-05 AT command in CuteCom

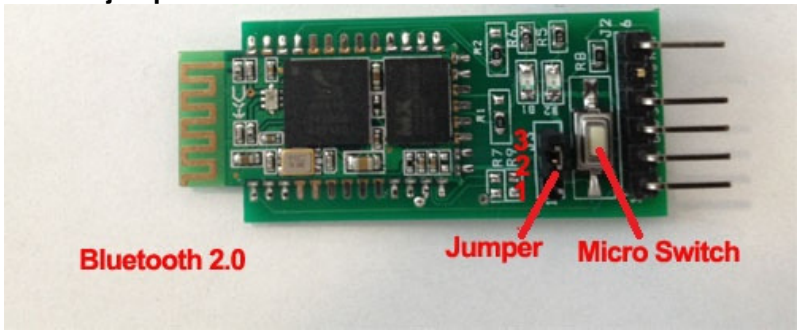
*** speed 9600**

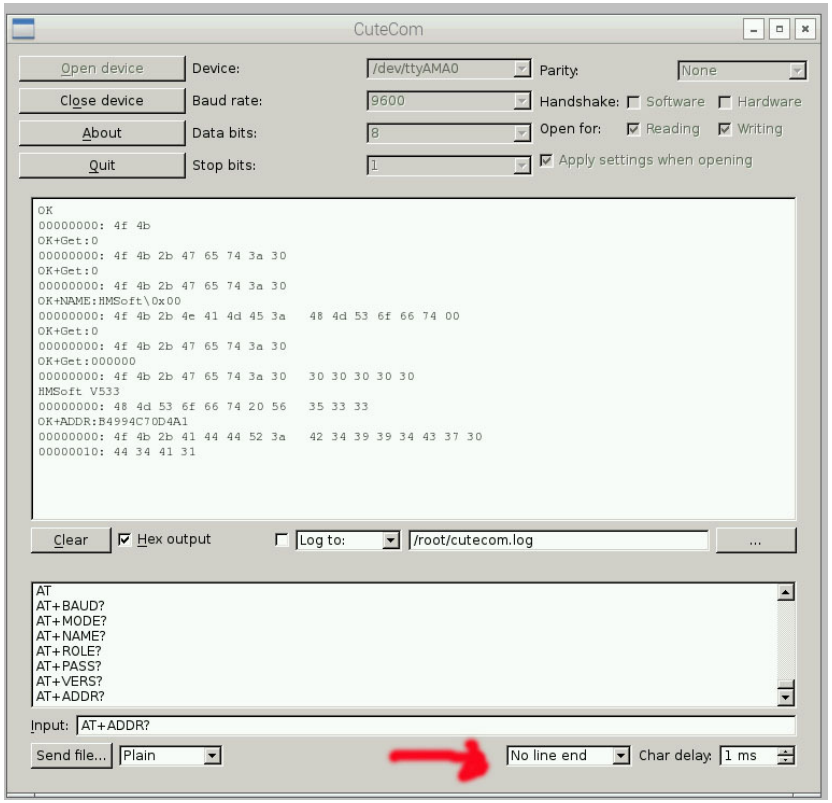
*** Choose CR,LF line end**

*** 2 way to enter AT command mode**

1. * power on Pi first, press and hold the micro switch, then plug in the socket, release the switch

2 * power on Pi first, move jumper to 1-2, then plug in the socket, remove jumper to 2-3

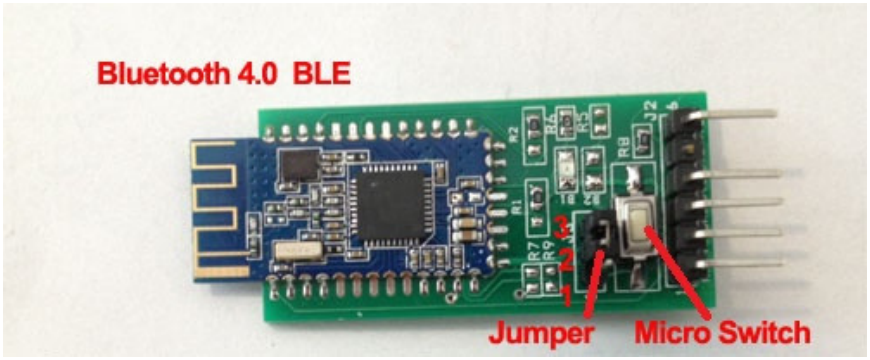


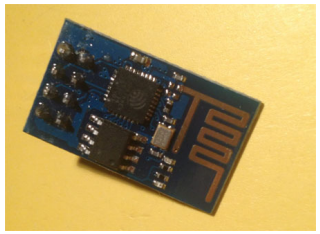


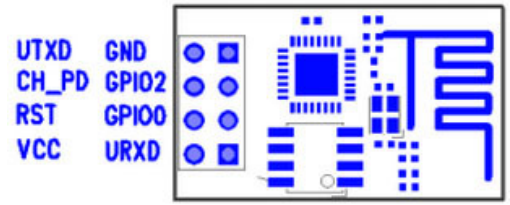
Bluetooth v4.0 BLE HM-10 AT command in CuteCom

* speed 9600

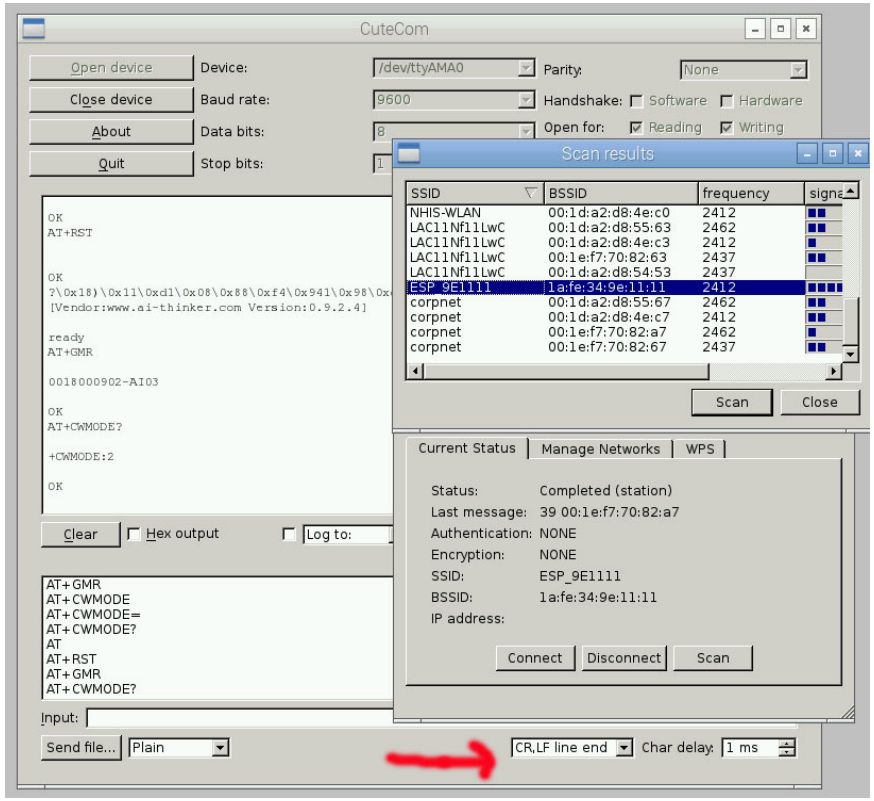
* Choose No line end







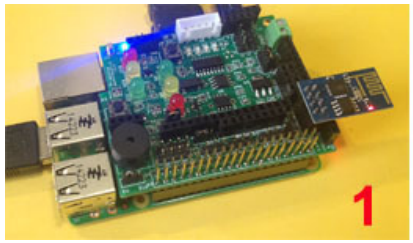
ESP8266 WiFi module AT command example

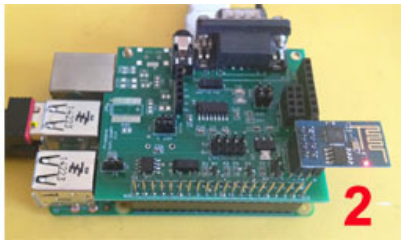


ESP8266 WiFi serial module AT command in CuteCom

*** speed 9600 /or**

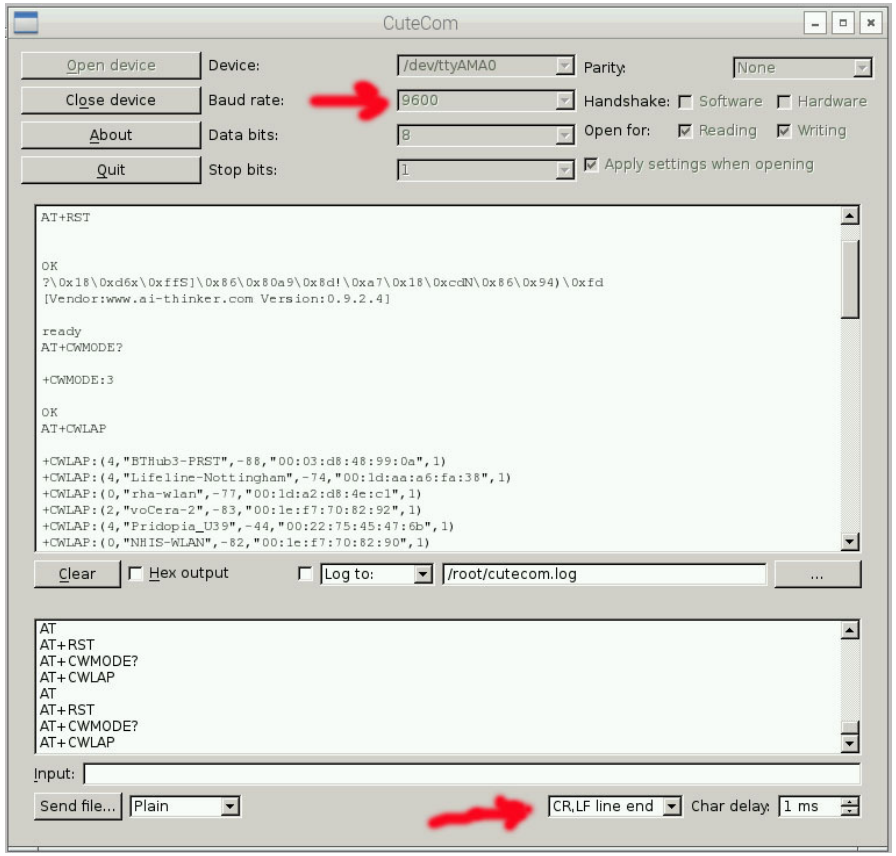
*** Choose CR,LF line end**





ESP8266 AT Command Set

Function	*AT Command*	*Response*
Working	AT	OK
Restart	AT+RST	OK [System Ready, Vendor:www.ai-thinker.com]
Firmware version	AT+GMR	AT+GMR 0018000902 OK
List Access Points	AT+CWLAP	AT+CWLAP +CWLAP:[4,"RochefortSurLac",-38,"70:62:b8:6f:6d:58",1) +CWLAP:[4,"LiliPad2.4",-83,"f8:7b:8c:1e:7c:6d",1) OK
Join Access Point	AT+CWJAP? AT+CWJAP="SSID","Password"	Query AT+CWJAP? +CWJAP:"RochefortSurLac" OK
Quit Access Point	AT+CWQAP=? AT+CWQAP	Query OK
Get IP Address	AT+CIFSR	AT+CIFSR 192.168.0.105 OK
Set Parameters of Access Point	AT+ CWSAP? AT+ CWSAP= <ssid>,<pwd>,<chl>, <ecn>	Query ssid, pwd chl = channel, ecn = encryption
WiFi Mode	AT+CWMODE? AT+CWMODE=1 AT+CWMODE=2 AT+CWMODE=3	Query STA AP BOTH
Set up TCP or UDP connection	AT+CIPSTART=? (CIPMUX=0) AT+CIPSTART = <type>,<addr>,<port> (CIPMUX=1) AT+CIPSTART= <id><type>,<addr>, <port>	Query id = 0-4, type = TCP/UDP, addr = IP address, port= port
TCP/UDP Connections	AT+ CIPMUX? AT+ CIPMUX=0 AT+ CIPMUX=1	Query Single Multiple
Check join devices' IP	AT+CWLIF	
TCP/IP Connection Status	AT+CIPSTATUS	AT+CIPSTATUS? no this fun
Send TCP/IP data	(CIPMUX=0) AT+CIPSEND=<length>; (CIPMUX=1) AT+CIPSEND= <id>,<length>	
Close TCP / UDP connection	AT+CIPCLOSE=<id> or AT+CIPCLOSE	
Set as server	AT+ CIPSERVER= <mode>[,<port>]	mode 0 to close server mode; mode 1 to open; port = port
Set the server timeout	AT+CIPSTO? AT+CIPSTO=<time>	Query <time>0~28800 in seconds
Baud Rate*	AT+CIOBAUD? Supported: 9600, 19200, 38400, 74880, 115200, 230400, 460800, 921600	Query AT+CIOBAUD? +CIOBAUD:9600 OK
Check IP address	AT+CIFSR	AT+CIFSR 192.168.0.106 OK
Firmware Upgrade (from Cloud)	AT+CIUPDATE	1. +CIPUPDATE:1 found server 2. +CIPUPDATE:2 connect server 3. +CIPUPDATE:3 got edition 4. +CIPUPDATE:4 start update
Received data	+IPD	(CIPMUX=0): + IPD, <len>: (CIPMUX=1): + IPD, <id>, <len>: <data>
Watchdog Enable*	AT+CSYSWDTENABLE	Watchdog, auto restart when program errors occur: enable
Watchdog Disable*	AT+CSYSWDTDISABLE	Watchdog, auto restart when program errors occur: disable



ESP8266 WiFi serial module AT command example

**** Join Router**

AT+RST

AT+CWMODE=3

AT+CWLAP ---- search WiFi Network

AT+CWJAP="your ssid","password" **join your Router Spot**

AT+CWJAP=? ---- check if connected successfully

****** Acting as a TCP Client**

AT+CIPMUX=1

Specify which connection channel you wish to connect on (0 - 4), the protocol type (TCP/UDP), the IP address (or

domain if you have DNS access) and the port number using the CIPSTART command:

AT+CIPSTART=4,"TCP","google.com",80

You should receive the response OK followed by Linked when the connection is open:

AT+CIPSEND=4,18

This time, instead of an "OK" response your will get a > prompt:

GET / HTTP/1.0

The module should respond with: SEND OK

The module should provide a second response once the web server responds:

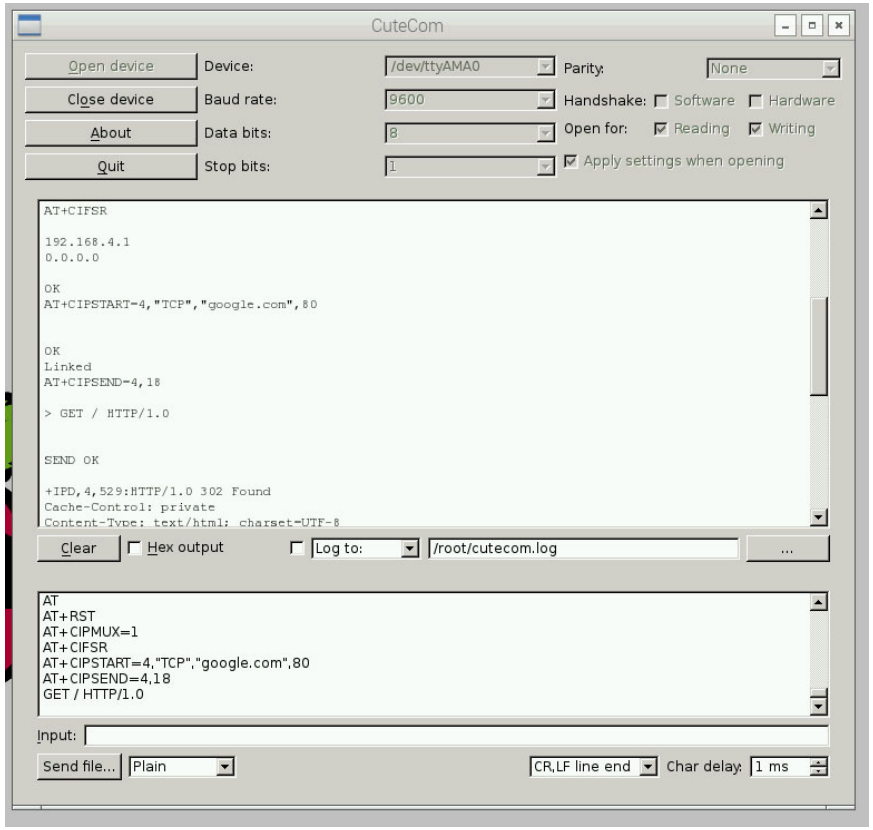
+IPD,4,529:

The 4 indicates it's data from connection channel 4 and the 529 indicates there's 529 bytes of data. You should now see the data:

HTTP/1.0 302 Found

Cache-Control: private

Content-Type: text/html: .....



****** Acting as a TCP Server**

1. Connect to a WiFi access point.

2. Enable multiple connections. AT+CIPMUX=1

3. Find out the IP address of the module: AT+CIFSR

Note the response, e.g.: 192.168.0.14

4. Set the module to listen (first parameter, mode is set to 1) for a connection on a specific port

(in this case port 1336): AT+CIPSERVER=1,1336

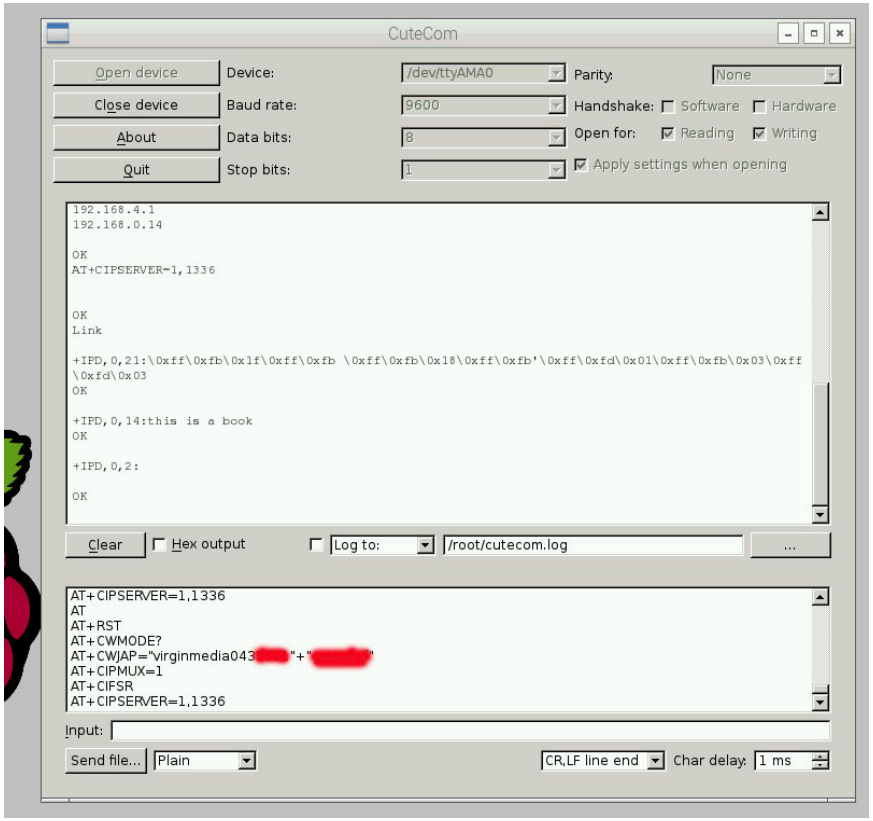
5. From another device on the same network connect to the listening port, e.g. with telnet:

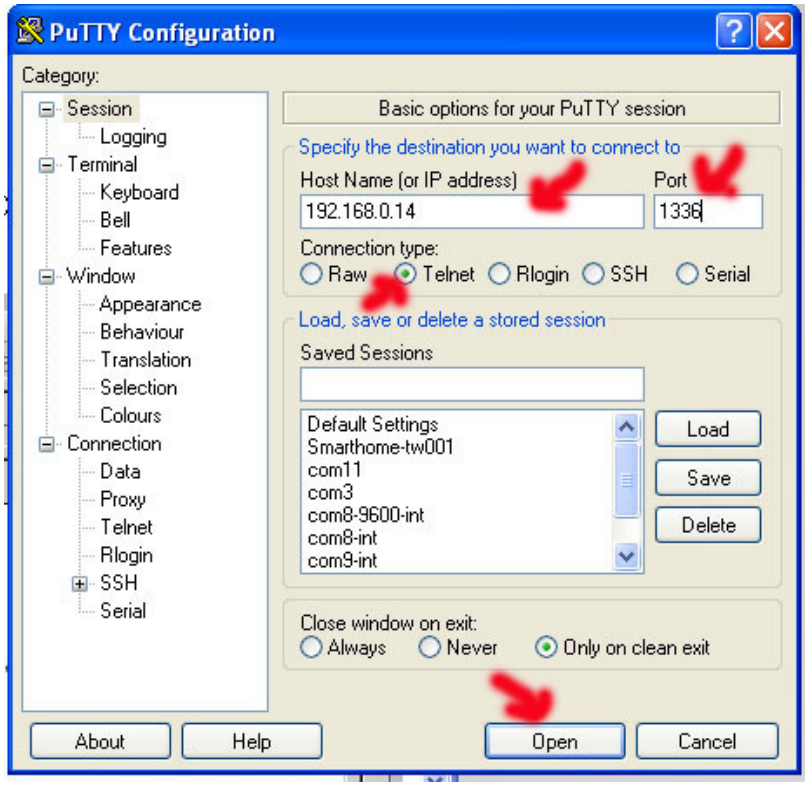
use PuTTY login from PC

The module should display: Link

Type some text into the telnet session, e.g.: this is a book

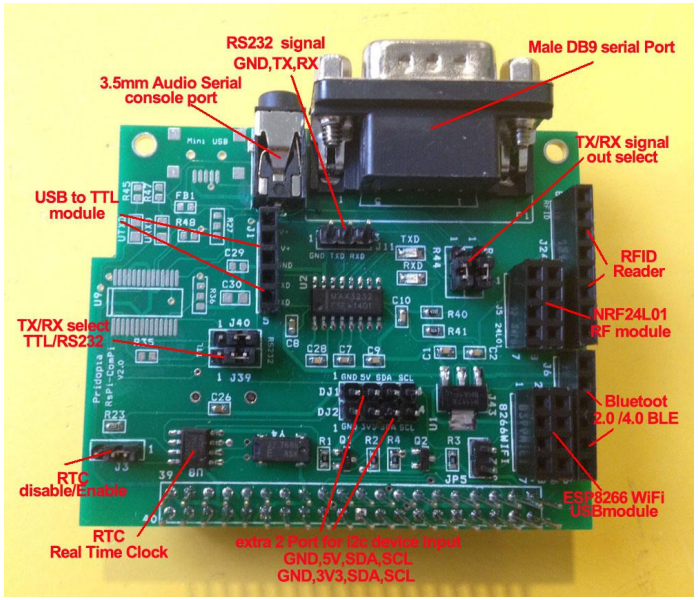
The module should display the following (0 being the connection channel, 14 being the length of the data received: +IPD,0,14:this is a book OK

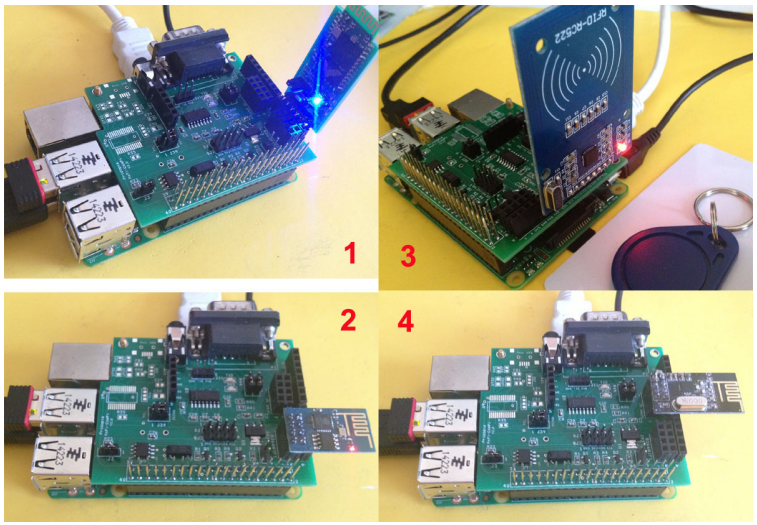




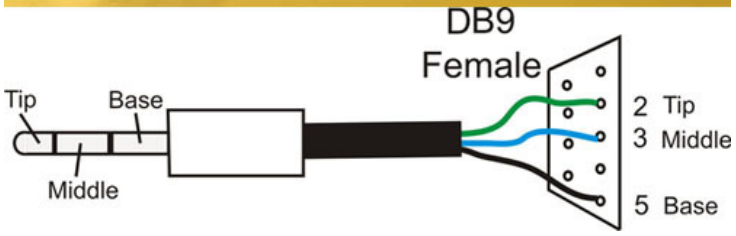
use PuTTY Telnet function to login from PC

2. EDU-Learing Kit-V2 EDU-V2-E02 - TX-RX-RS232 Learning Kit for advance user (Enable/Disable serial console Port) (support Raspberry Pi B2/A+/B+)

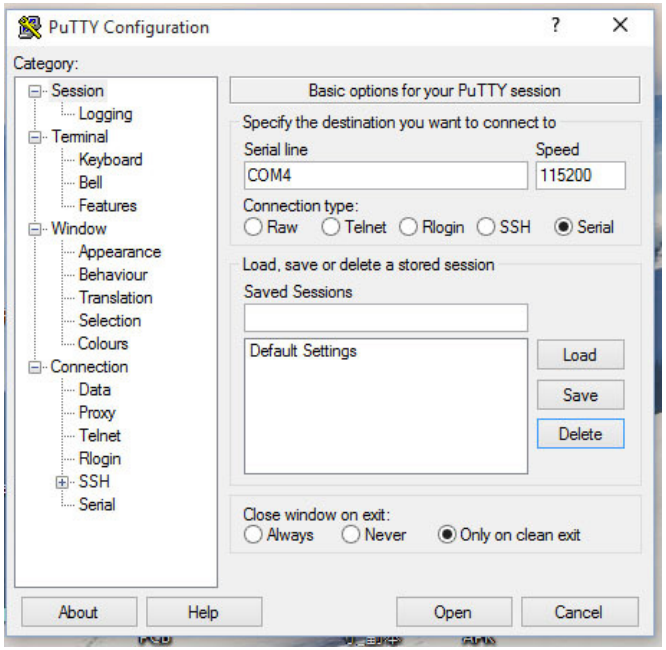




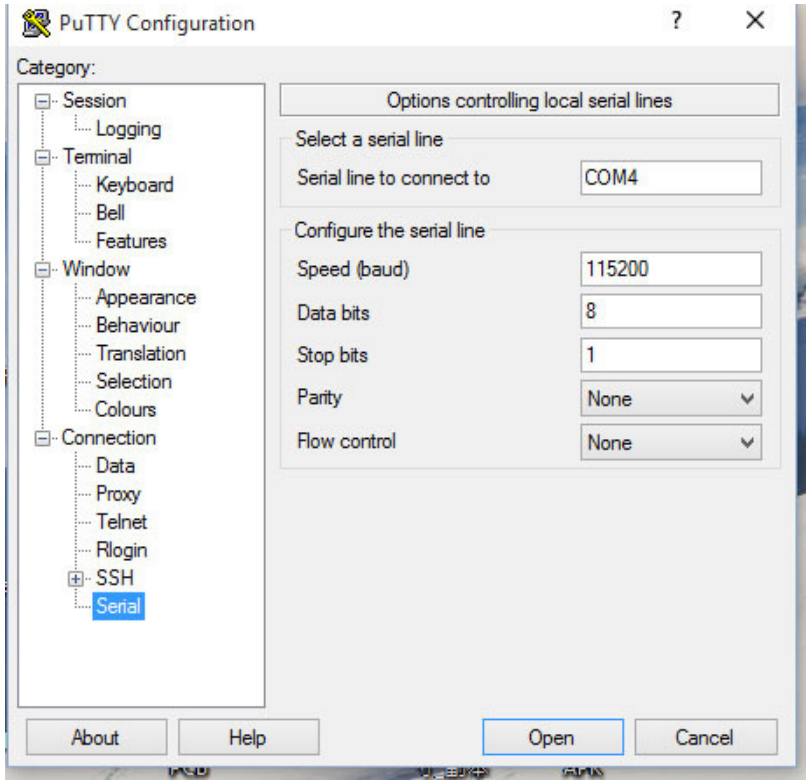
1. Bluetooth V2.0 2. ESP8266 Serial WiFi Module
3. RFID Reader 4. NRF24L01



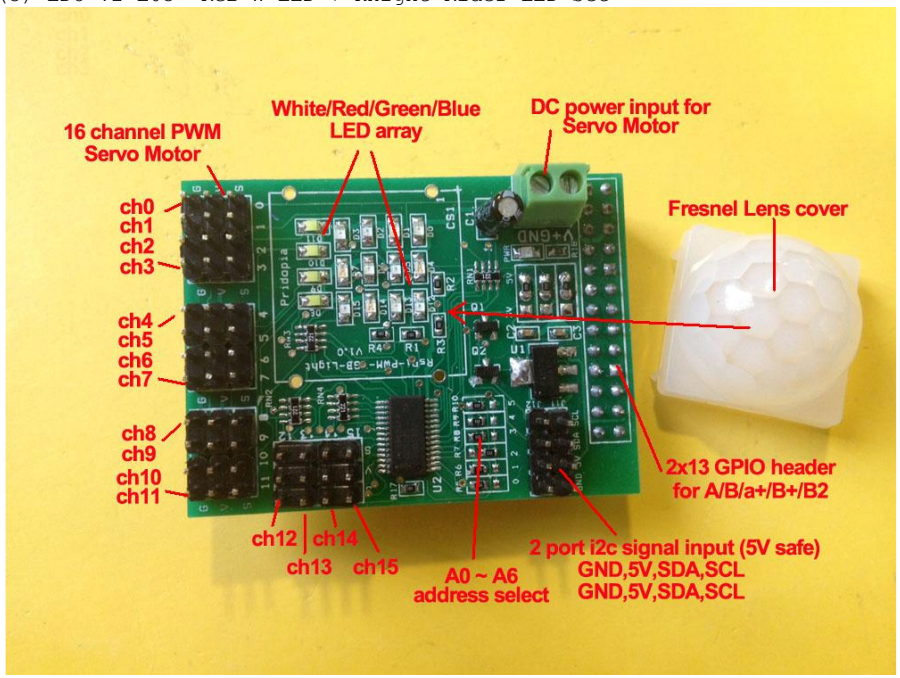
3.5mm audio serial console cable

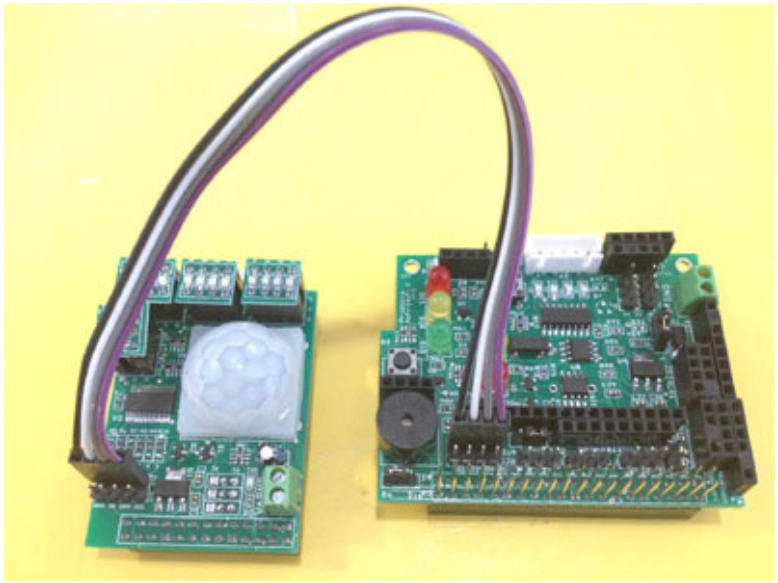


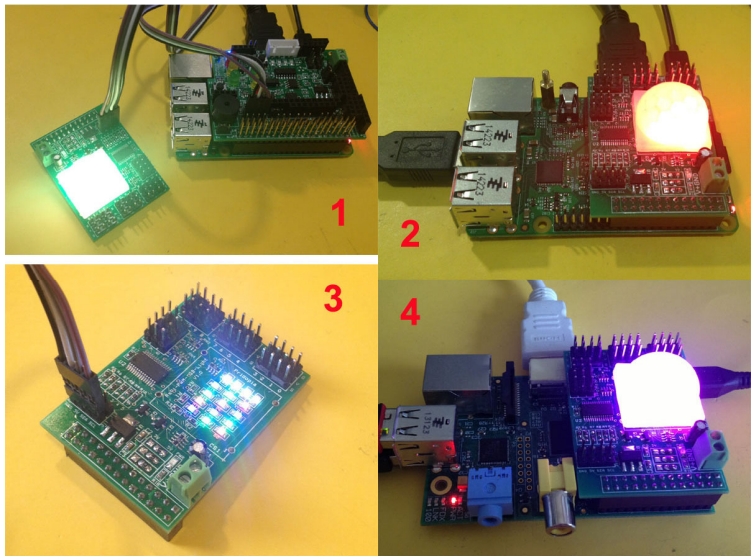
Serial port setting in Putty



(3) EDU-V2-E03 RGB-W LED 7 Knight Rider LED Set

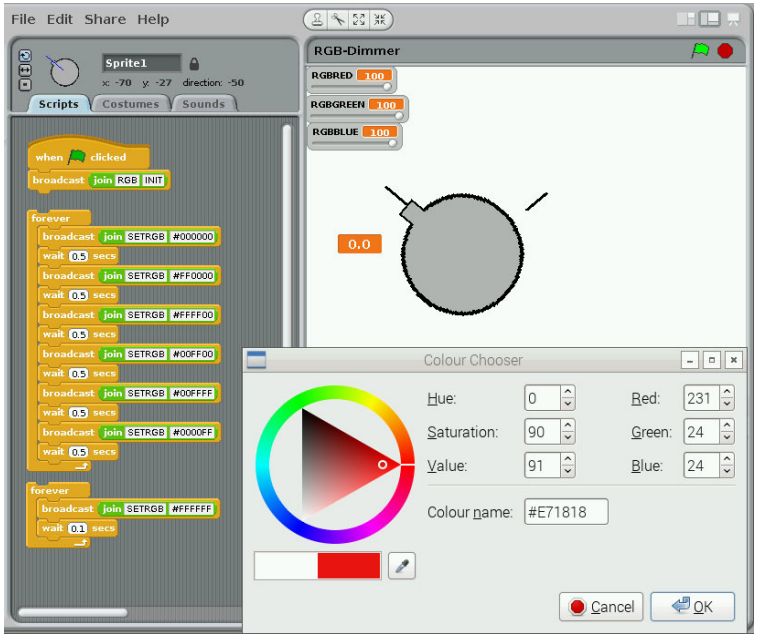


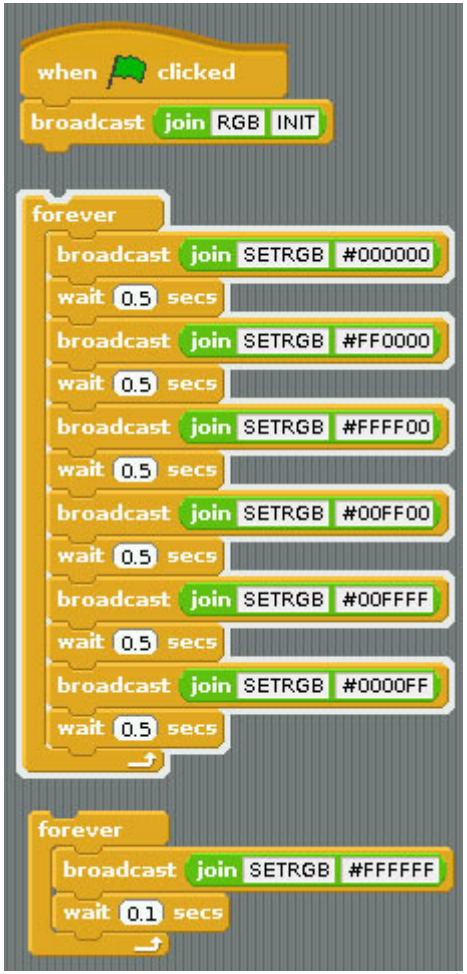




Command "RGBINIT" will active RGB function, open a window for "Colour Chooser"

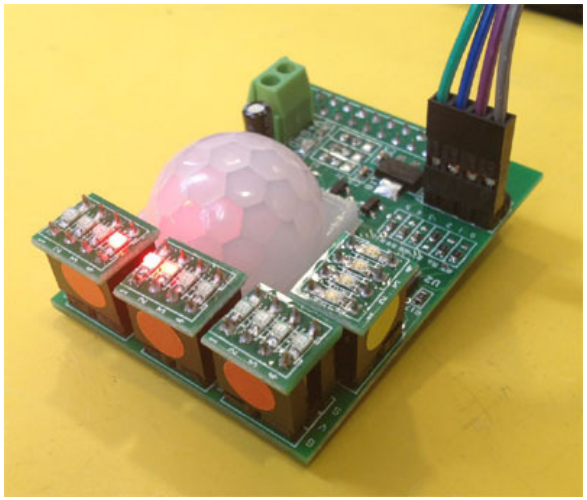
choose the colour code from "Colour Chooser"





choose the colour code from "Colour Chooser"

Knight Rider LED Kit



LED Scrolling Command

PWMLED44S0E0D4KITT

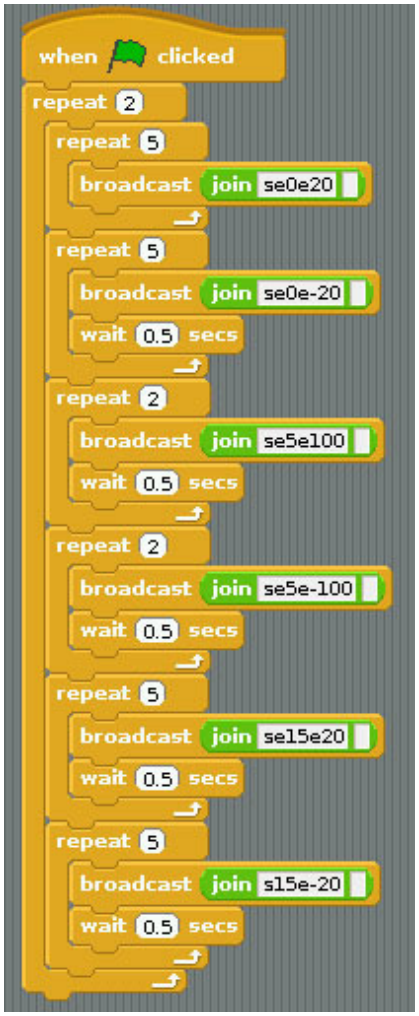
PWMLED"Address" S[Start channel] E[End channel] D[Delay / Timing] [True/False/KITT/KITT2] Address 41, 42,43,44 Start channel & End channel 0 ~ 15 16 channel D 1,2,3,4,5 (1 ~ 100) Delay Timing LED [True/False/KITT/KITT2] 4 type LED show

Brightness control Command

PWMLED "Address" "B" "0 ~ 1000" PWMLED41B1000

Stop command "PWMLED41STOP"

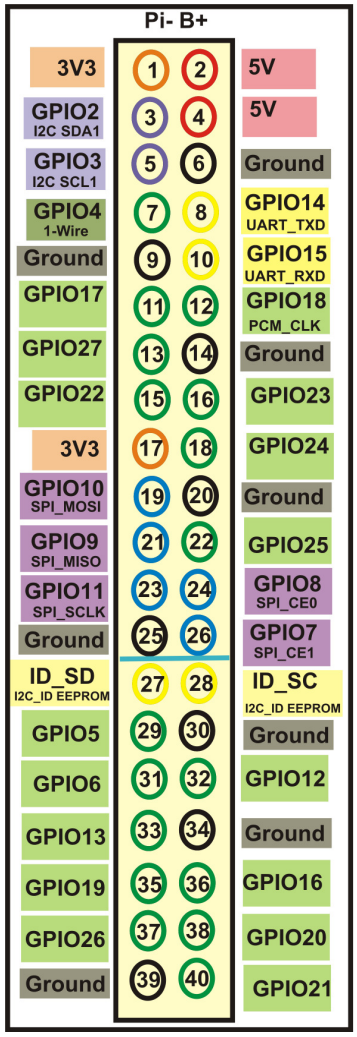
PWM Servo Motor control




```
Command "SE"+ "PWM (0-15)" + "e" +"angle"  for Address 44

 Se15e10   --> channel 15 servo move 10 angle  address 44
 Se15e-10  --> channel 15 servo move -10 angle address 44
 se0e10    --> channel 0 servo move 10 angle  address 44
 se0e-10   --> channel 0 servo move -10 angle  address 44
```

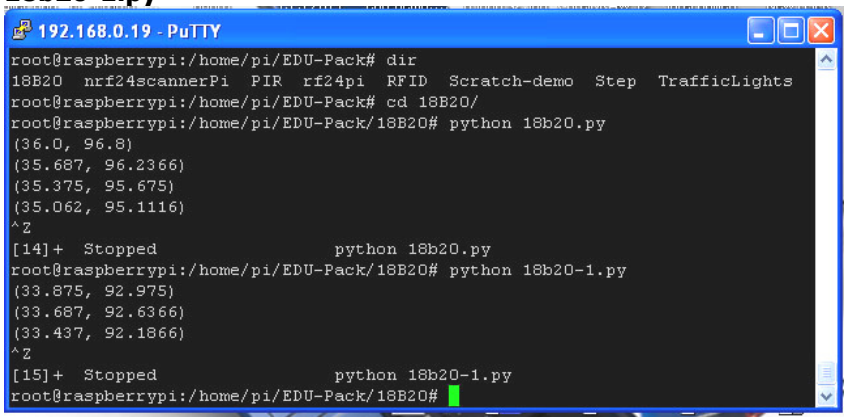

7. Example 01- Setting GPIO as output

1. define GPIO 5,6,12,13,16,19,20,21,26 as output
2. send GPIO 5,6,12,13,16,19,20,21,26 LED "ON"
3. send GPIO 6,13,16,20,26 LED "OFF" & 5,12,19,21 LED "ON"
4. send GPIO 6,13,16,20 LED "ON" & 5,12,19,21 LED "OFF"

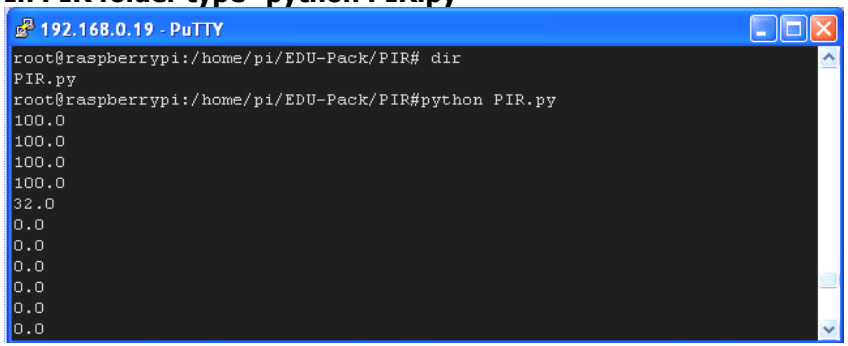


Python Test Code

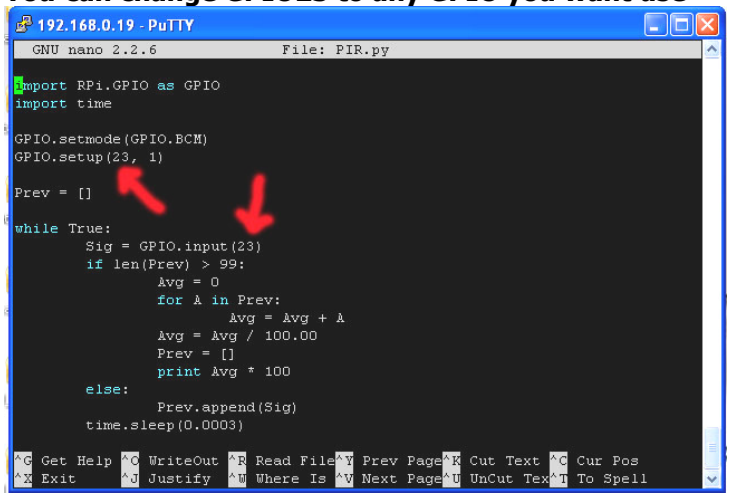
In EDU-Pack "18B20" folder Type python 18b20.py or python 18b20-1.py

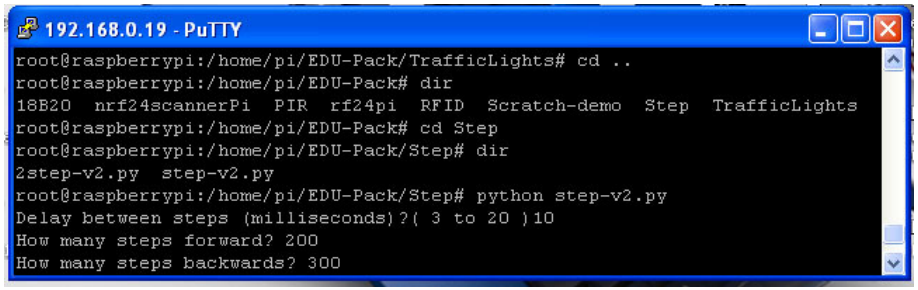


In PIR folder type "python PIR.py"

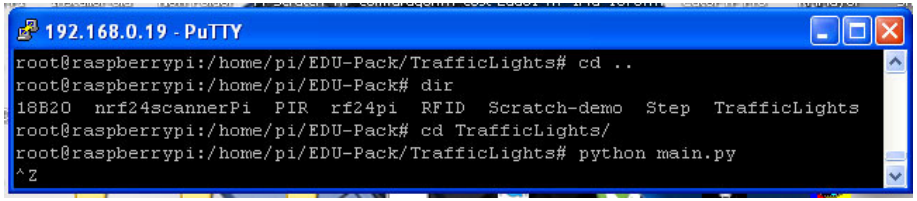


You can change GPIO23 to any GPIO you want use

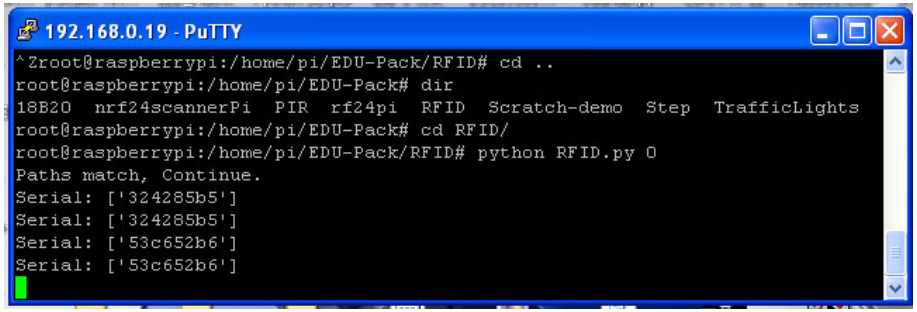




In "Step" folder python step-v2.py for 1 step motor
Type "python step-v2.py"



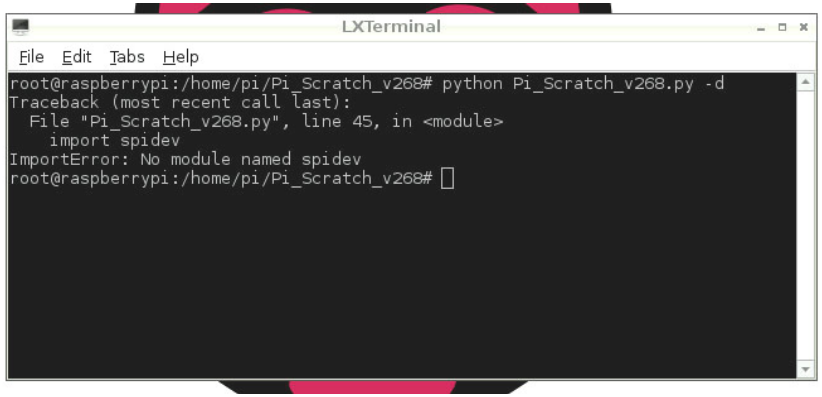
In "TrafficLight" folder mina.py
Type "python main.py"



In "RFID" folder RFID.py
Type "python RFID.py 0" for CE0

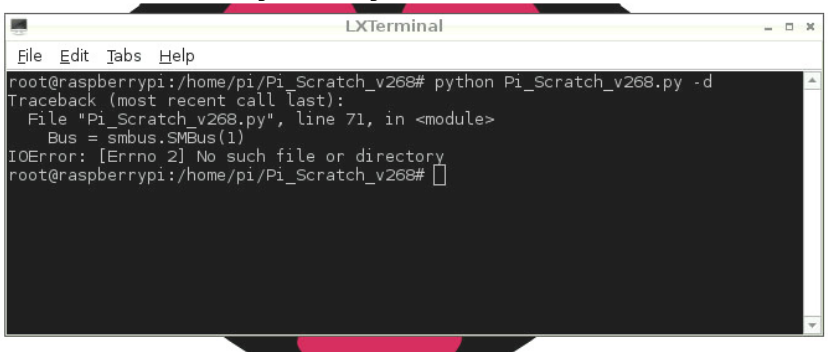
Pi _Scratch Install Q & A

1. When you type "python Pi_Scratch_v268.py -d"
You see following message

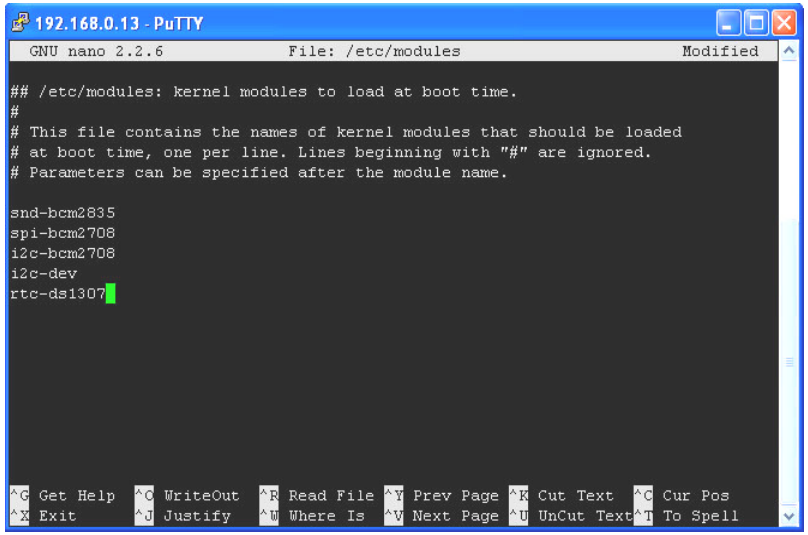


Type "python Install.py" install again

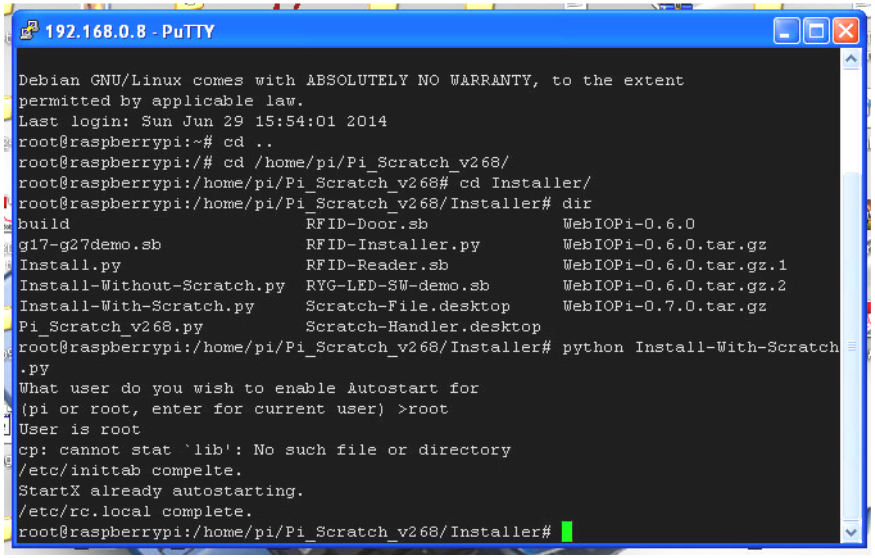
2. When you type "python Pi_Scratch_v268.py -d"
You see following message



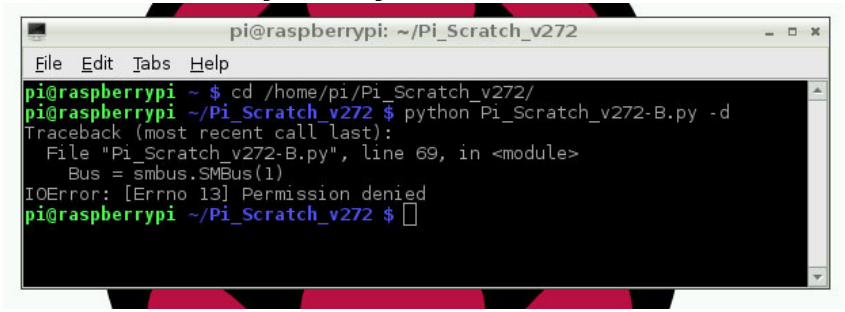
Check your setting in /etc/modules by use
sudo nano /etc/modules



3. Use manually start Pi_Scratch first, after everything working fine, then setting Auto login and auto start , use root first

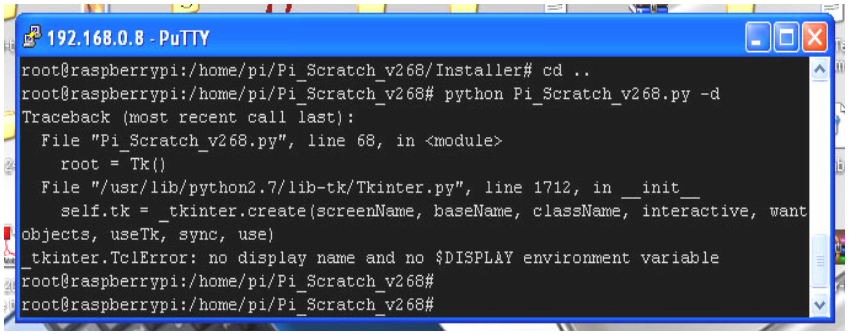


4. When you type “python Pi_Scratch_v272-B.py -d”
You see following message

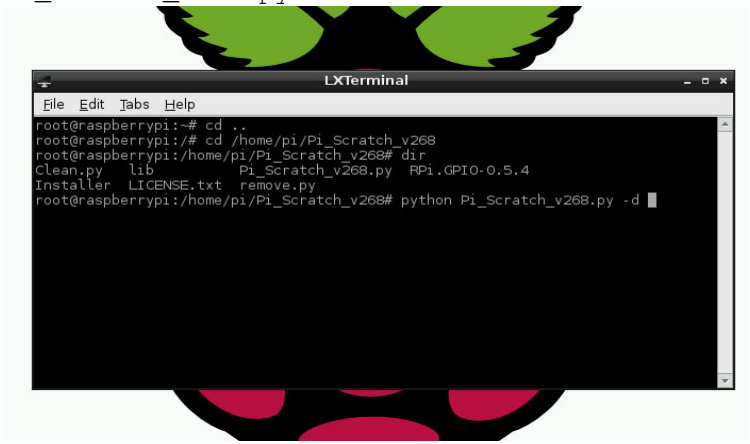


Use “root” to login your Pi, because some of the software function need access your Pi

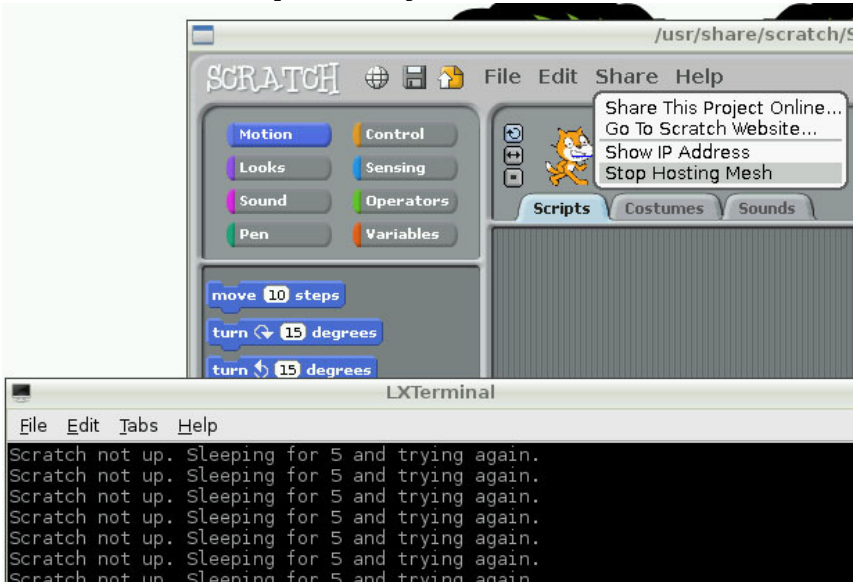
5. When you type “python Pi_Scratch_v268.py -d”
You see following message



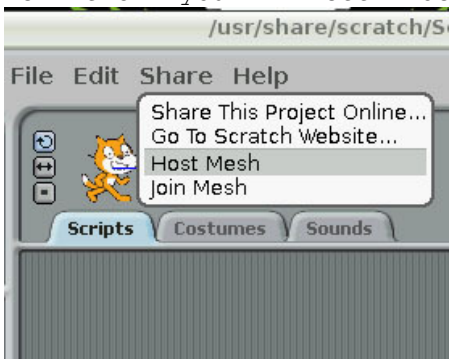
Type “startx” first, the open “LXTerminal” type “python Pi_Scratch_v268.py -d”



6. When Manually start Pi_Scratch if you can’t see “Host Mesh” Choose “Stop Hosting Mesh” first,



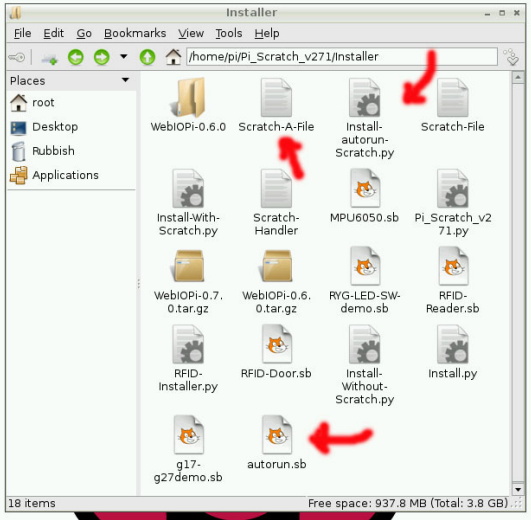
“shift S” you will see “Host Mesh”



How to auto run Pi_Scratch without press any key

Type "python Install-autorun-Scratch.py"

Will do the setting for you also copy the autorun.sb example file



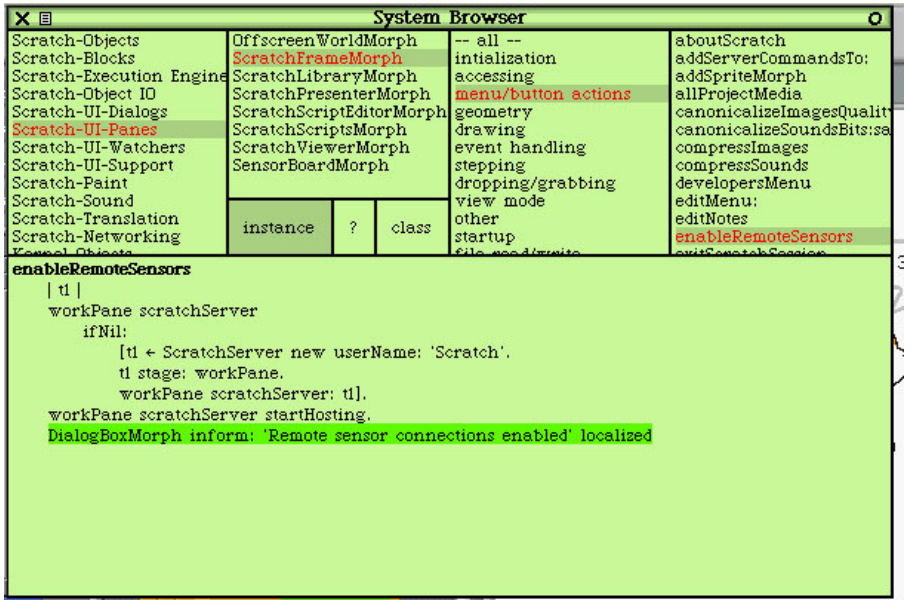
Use Pi_Scratch_V271

When receive "**startup**" to active auto run example file

We now have the program auto run in presentation mode, but as mentioned earlier there is a pop-up message **"Remote sensor connections enabled"** that stop update information for sensor " it will update until you have clicked OK. This is something that needs to be turned off within the Scratch application, which is one of the hidden settings within Scratch.

After lauching Scratch shift left-click on the R in the Scratch logo (top left) and choose "turn fill screen off". Click on the white area to the right or bottom of the screen and choose "Open" and "Browser". Navigate to the section Scratch-UI-Panes -> ScratchFrameMorph -> menu/button actions -> enableRemoteSensors and remove the line:

Dialogboxmorph Inform: 'Remote Sensor Connections Enabled' Localized

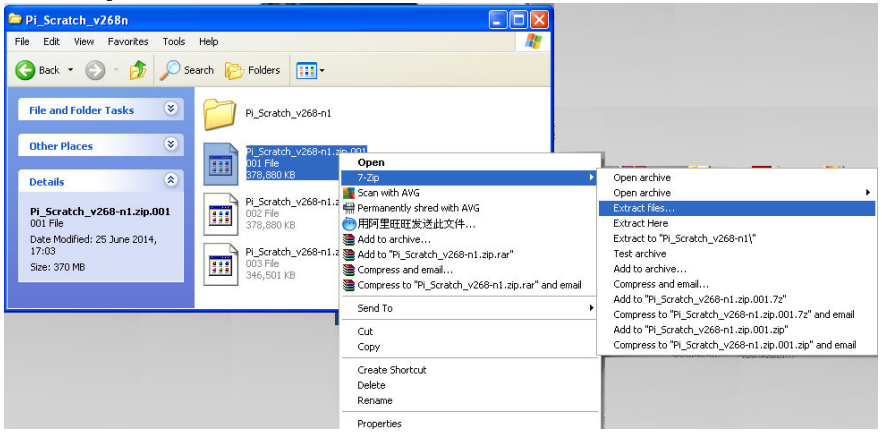


Then click with the centre mouse button (or Ctrl and left button) and choose Accept (s).

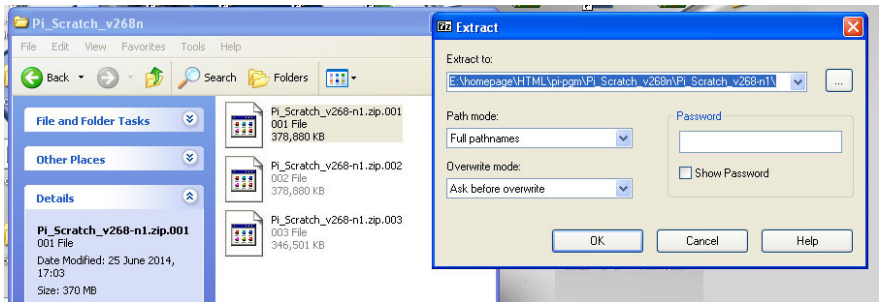
You can now remove the white space in Scratch by shift left click on the R in Scratch logo and choose Turn Fill screen on. Finally shift left click on the logo again and choose **"save image for end-user"**

How to use three zip file change to Image file

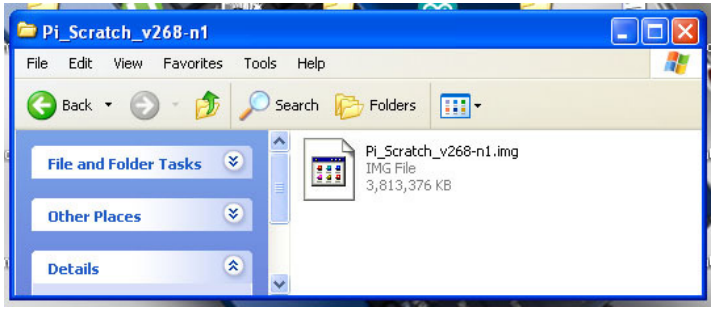
Use 7-Zip software



Copy three zip file into one new folder, use 7-zip, click right mouse key choose “Extract files”



Click “OK”



After finished, you will have Pi_Scratch-V268-n1.img

Upzip 3 zip file for Linux

1) Download all the files to the same directory such as /home/pi/Scratch

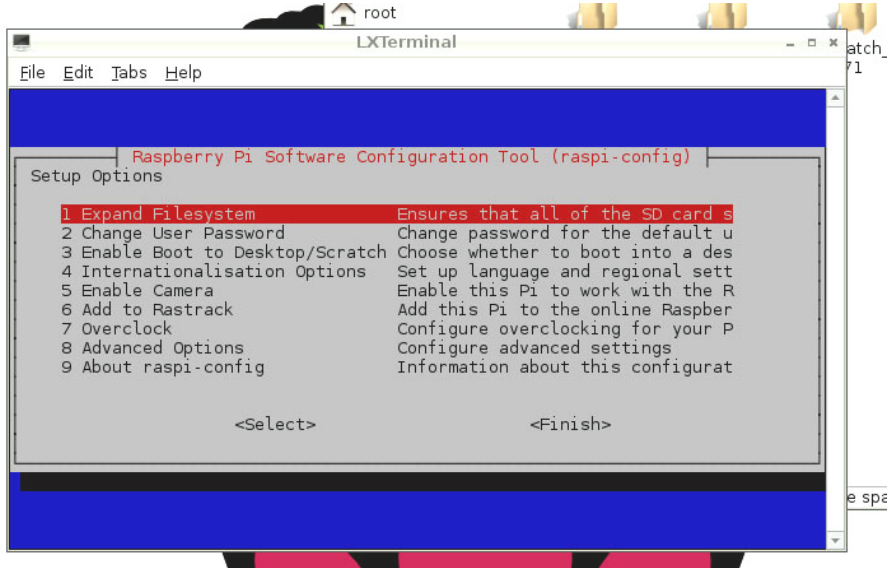
2) If they are named in the same format as Pi_Scratch.... then you can run "cat Pi_Scratch* >> merged.zip" or the name of the files minus the zip file extension & 001, 002 etc.

3) run "unzip -FF merged.zip" to unzip the image.

4) run the DD command to copy the image to another storage unit (SD card, USB drive etc.)

If either one of the archives has a missing part / sector then the unzip will fail.

First thing need do for Pi_Scratch ready Image



Use the Pi_Scratch ready Image first thing you need do

sudo raspi-config

Choose 1 “expand Filesystem to Ensures that all of the SD card s

How to upgrade from old Pi_Scratch to new Ver Pi_Scratch

In old ver Pi_Scratch_268 folder --- remove auto-login auto run first

sudo python remove.py

then reboot

download new Ver Pi_Scratch

sudo wget http://pridopia.co.uk/pi-pgm/Pi_Scratch_v272.tar

tar xf Pi_Scratch_v272.tar

cd Pi_Scratch_v272

cd Installer

sudo python Install-autorun-Scratch.py --- auto run example without press any key - choose root

or

sudo python Install-with-Scratch.py --- auto load example but need click "ok" and "greeng flag" in scratch - choose root

Pi_Scratch-v272 ready Image information

Use Raspbian Wheezy 2014-06-20

ready to use Pi_Scratch_v272 with Auto Login & Auto Load Pi_Scratch & SSH enable --

SSH enable -- user - root password : pi for 4GB SD card

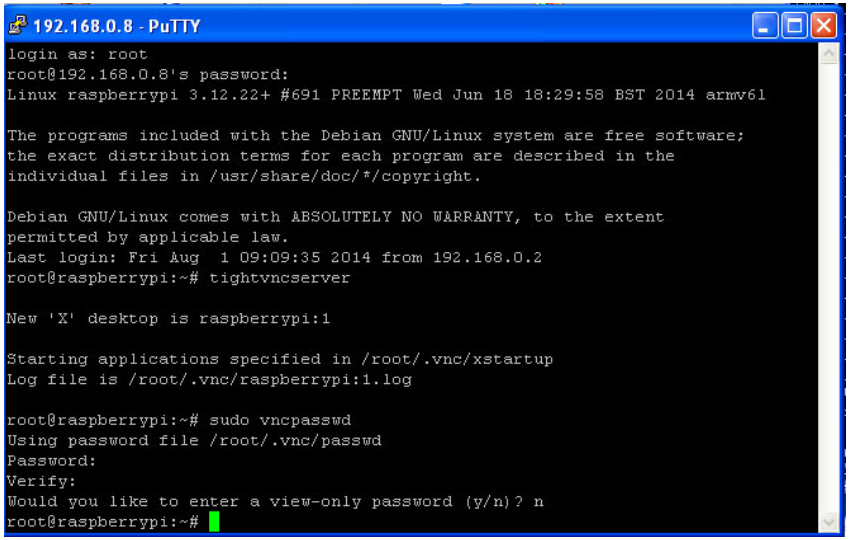
TightVNCserver install password : pipipi --

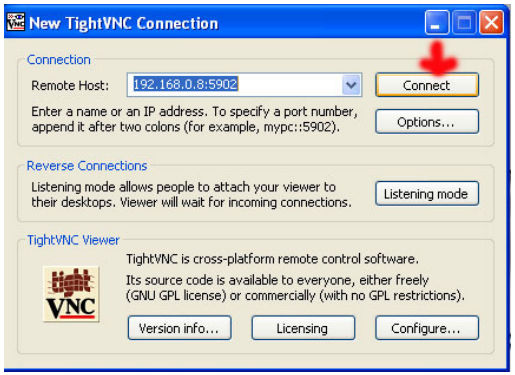
Use **sudo vncpasswd** to change password

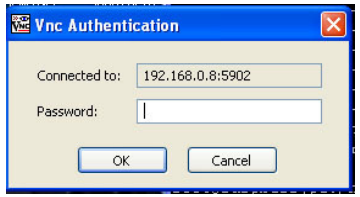
VNC (VIRTUAL NETWORK COMPUTING)

VNC is a graphical desktop sharing system that allows you to remotely control the desktop interface of one computer from another. It transmits the keyboard and mouse events from the controller, and receives updates to the screen over the network from the remote host. You will see the desktop of the Raspberry Pi inside a window on your computer. You'll be able to control it as though you were working on the Raspberry Pi itself.

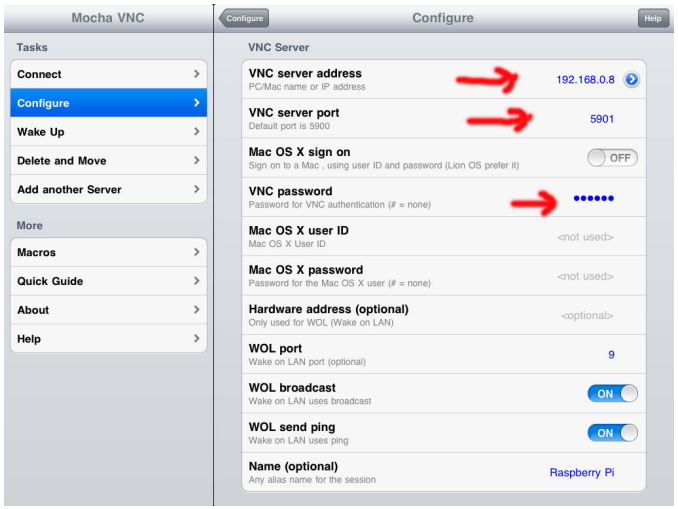
Type **tightvncserver** to start VNC control from PC Mac or iPad

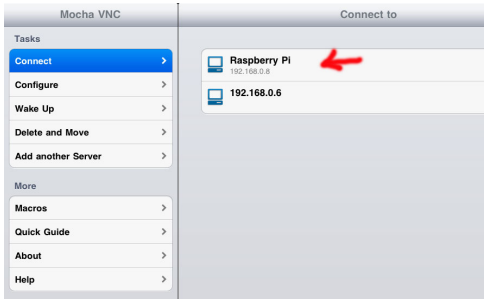


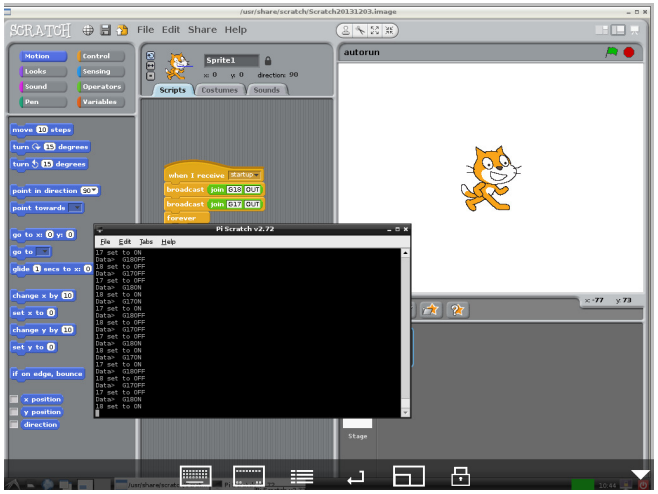




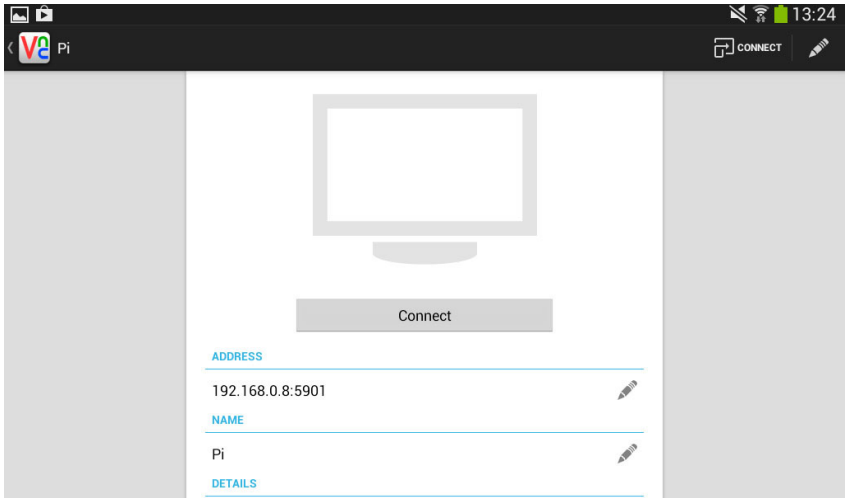
VNC connect from iPad & idevice

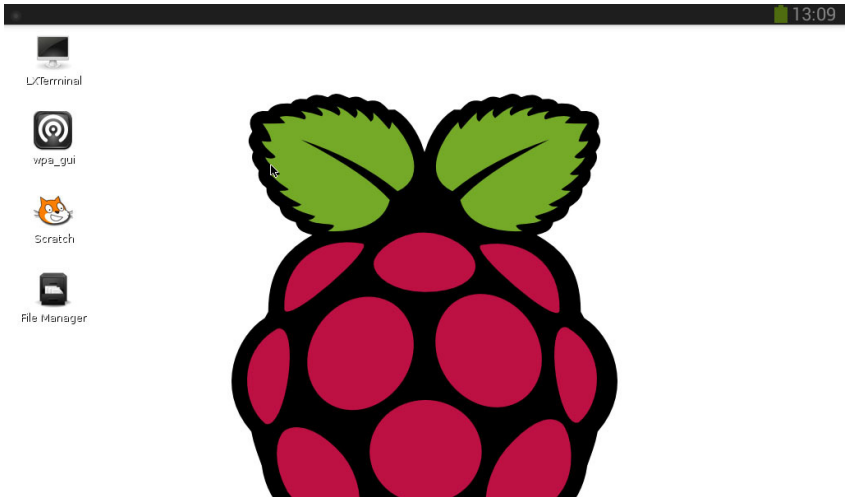






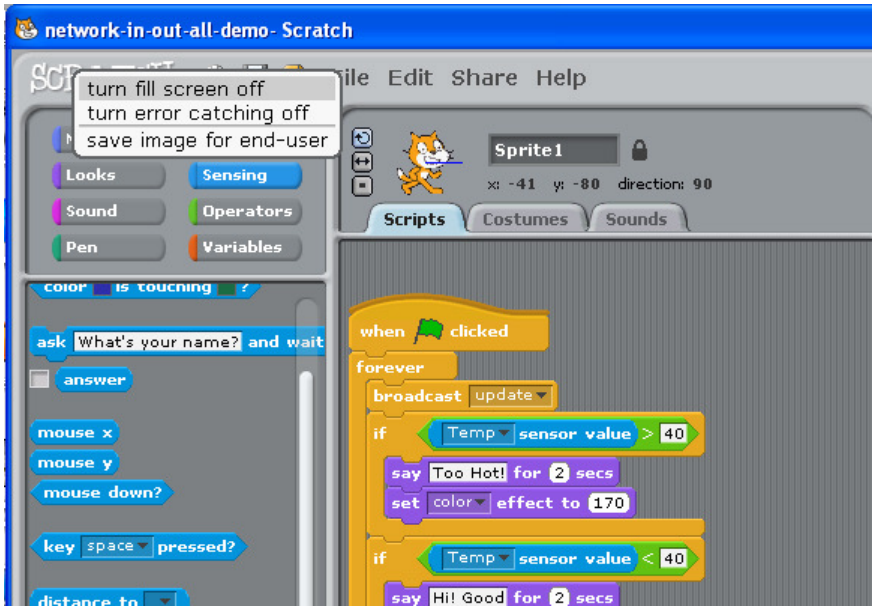
VNC connect from Android Smart Phone / Tablet



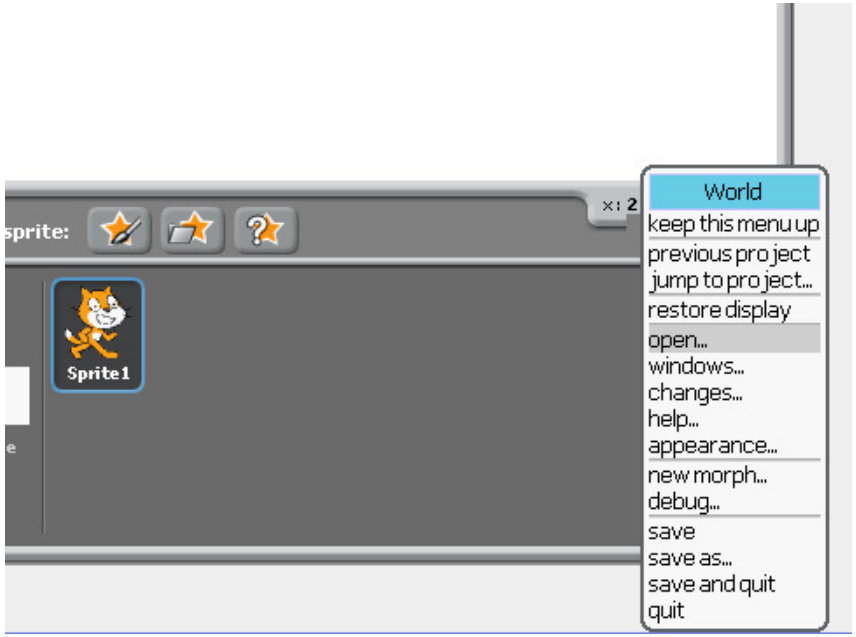


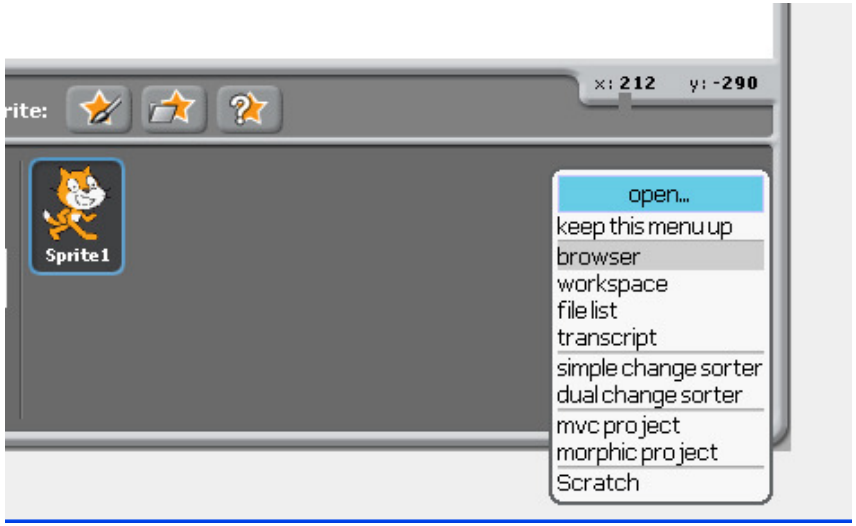
1. Scratch V1.4 Setting to Active Mesh function

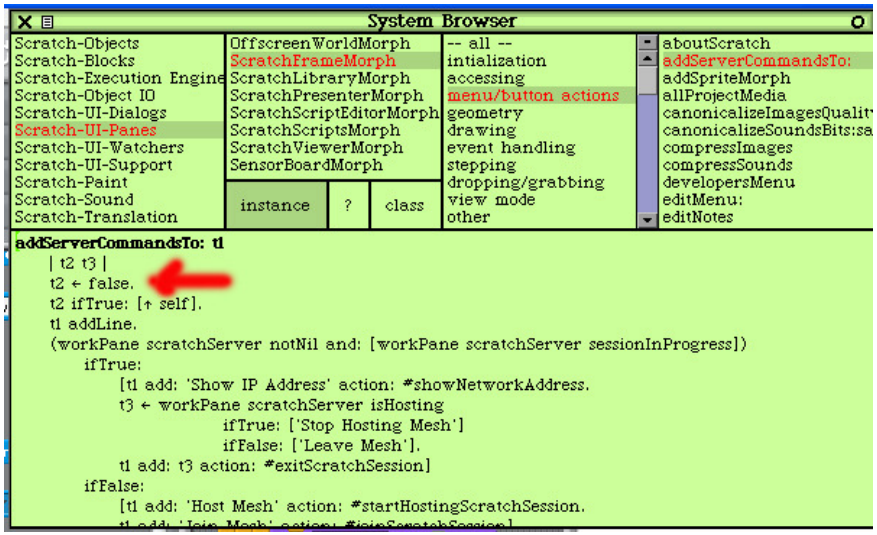
1. Shift-click the upper part of the R in the Scratch logo.



2. Select "turn fill screen off".
3. You will now have a white area at the bottom and right side of the screen. Click on the white area and select "open...".
4. Now select "browser".
5. Now you've opened the System Browser! In this place you can edit Scratch.





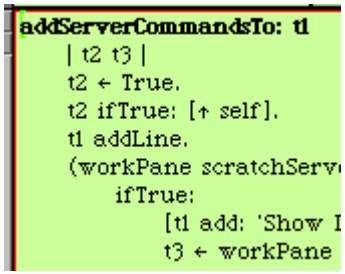


5. Now you've opened the System Browser! In this place you can edit Scratch.

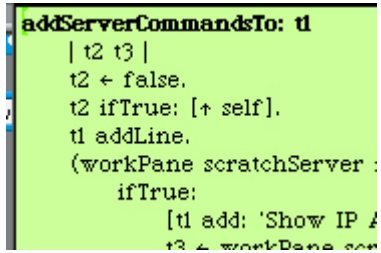
Go to Scratch-UI-Panes - ScratchFrameMorph - menu/button actions - addServerCommandsTo: .

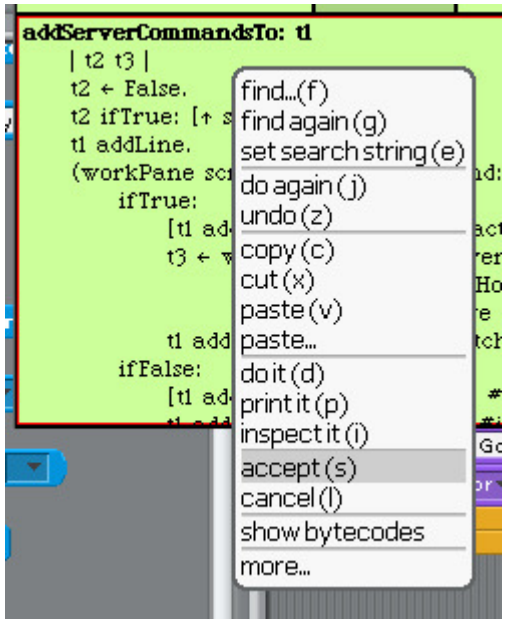
6. Look down, and edit the "t2 ← true" to "t2 ← false".
7. Right-click and select "accept".

(or press middle key or wheel)

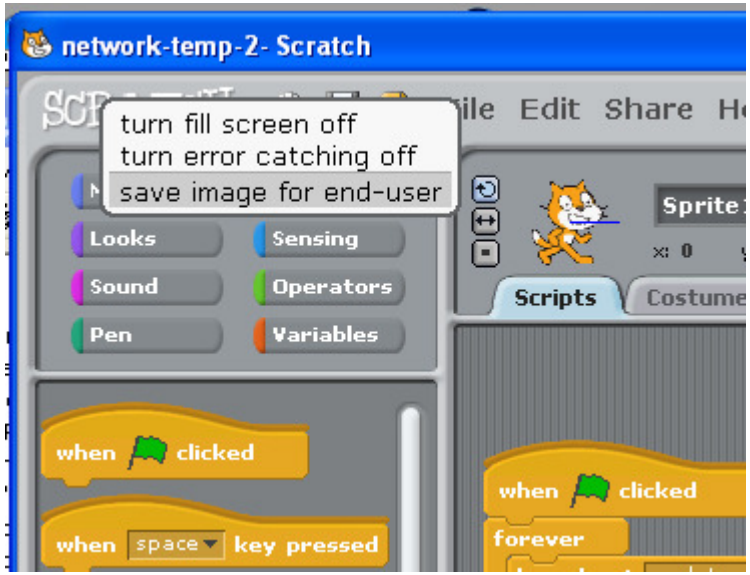


to





8. Enter in your initials (you can fake it, it doesn't matter) and click "accept".
9. Exit the System Browser.
10. Shift-click the R and select "turn fill screen on".



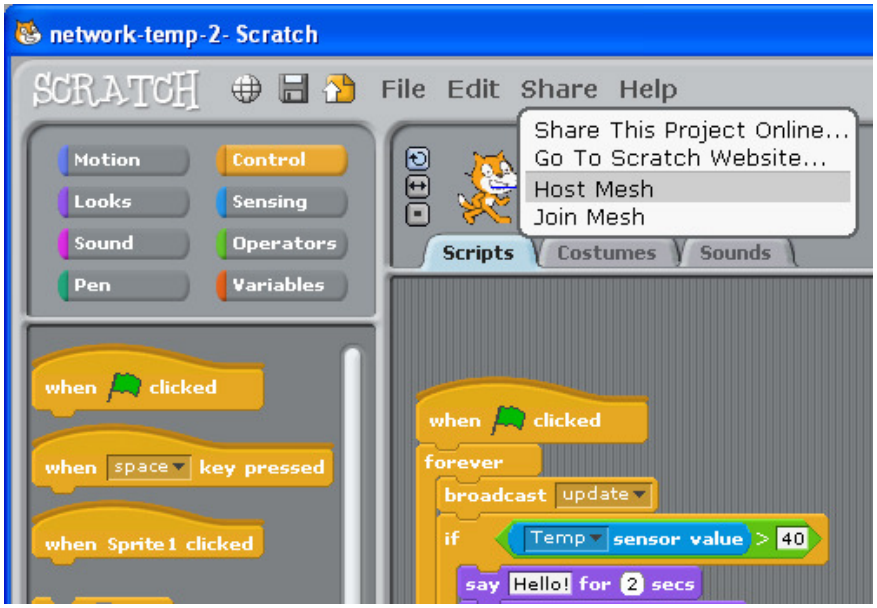
If you don't want to go through the process every time you want to use Mesh, you can save the System Browser so Mesh will stay available - Shift-click the R again and select "save image for end-user".

If you don't want Mesh anymore, just change the 'false' back to 'true'.

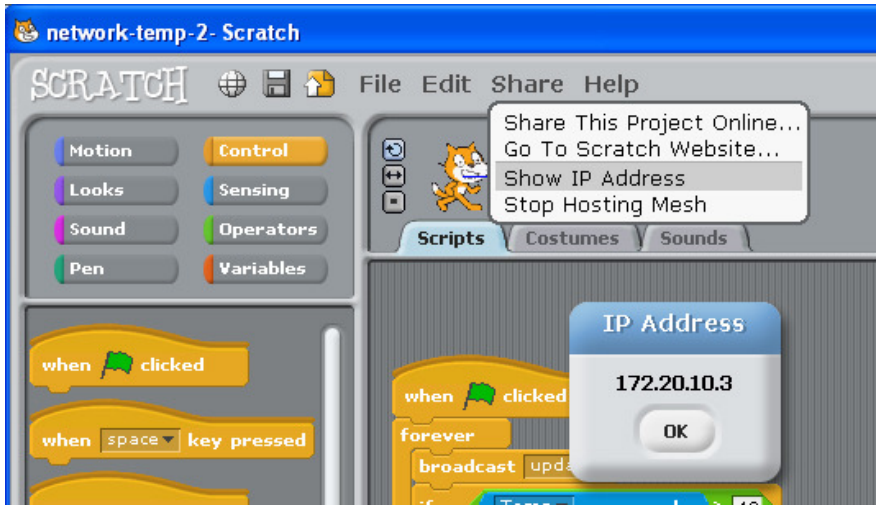
Active Mesh

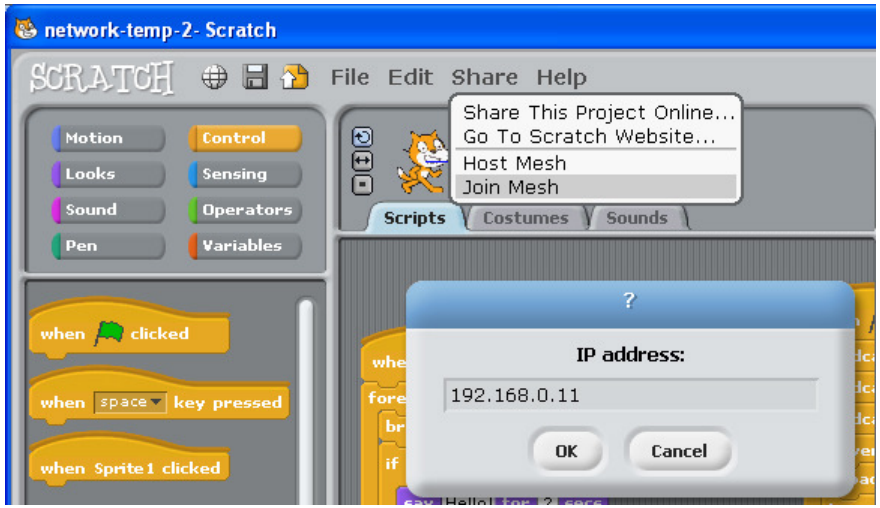
- **Host Mesh lets you host a Mesh session.**
- **Join Mesh lets you join a Mesh session.**

To host a Mesh session:
1. Click Host Mesh.
2. Done! Your IP address will show up



What if you want to join a Mesh session, but the person hosting the Mesh session forgot to tell you the IP address, and he/she forgot what the IP address is? He/she Shift-clicks the Share button and selects "Show IP address". The IP address will pop up like before.

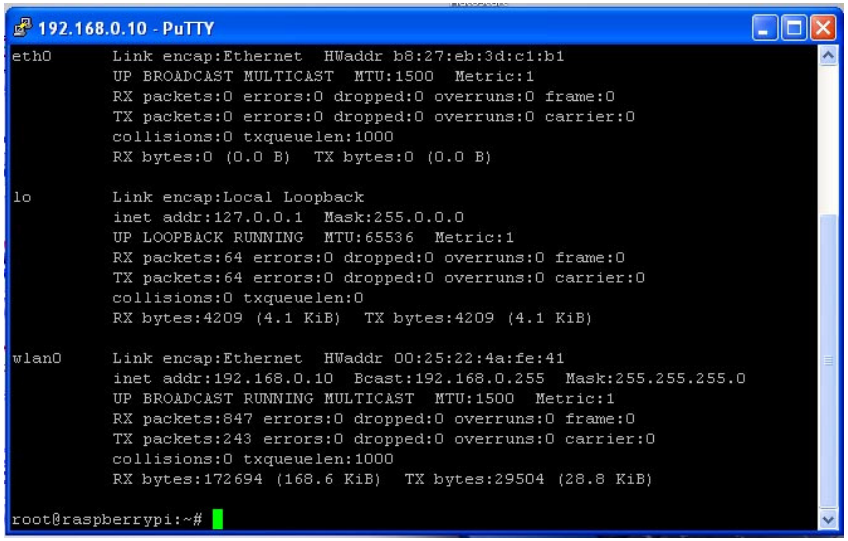




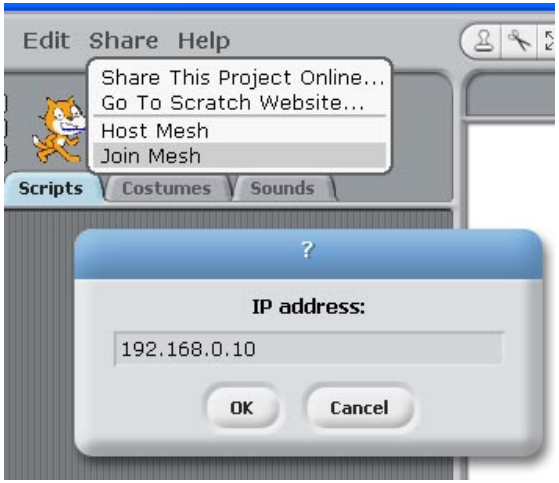
To join a Mesh session:
1. Click Join Mesh.
2. Enter in the IP address of the Raspberry Pi that is hosting the Mesh session. (use "ifconfig" in terminal command line)

A Mesh session can have more than two Scratch programs connected at once - there's no limit! All Scratch programs have to connect to the same IP though.

Use “ifconfig” check the IP of Raspberry PI



Join Mesh “input Raspberry Pi IP” login from Desktop or Laptop



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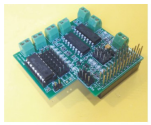
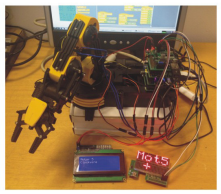
DC Motor Series

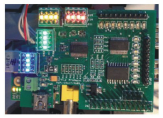


Rs-Pi-L293D-3
6 Motor Board

Rs-Pi-L293D-1
2 Motor Board



Rs-Pi-L293D-3 6 Motor-
i2c 20x4 LCD &
24 x16 LED Matrix Demo



PWM LED set demo
(Red, Green, Yellow, Blue)

RFID Reader

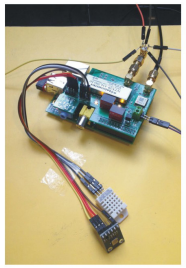
Rs-Pi-RFID Reader
&Relay & Step Motor
control

Rs-Pi-4 Relay
& Step Motor Board

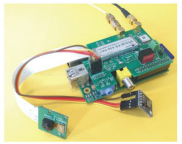
LED Matrix

Rs-Pi- LED 24x16
Matrix Board

Rs-Pi- LED 16x16
Matrix Board

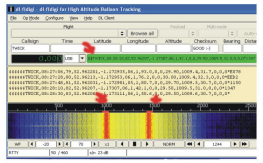


Rs-Pi-P-HAB 5V Board
(High-Altitude Balloon)



Rs-Pi-P-HAB 3.3V Board
(High-Altitude Balloon)

Rs-Pi-P-HAB & GPS Antenna
FM Antenna &
USB SDR Encoder



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United Kingdom
TEL: 0844-2492899

Software for Scratch
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Rs-Pi-4 USB Hub +
Multi-function i2c Board

Rs-Pi-4 USB Hub +
32 GPIO(i2c/SPI) Board

7 USB Hub Series

Rs-Pi-7 USB Hub +
Multi-function i2c Board

Rs-Pi-7 USB Hub +
16 GPIO (i2c/SPI) Board

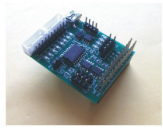
PWM / Servo Series

Rs-Pi-32 channel
PWM/Servo Board

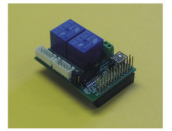
Rs-Pi-16 channel PWM
& 16 GPIO (i2c/SPI)Board

Rs-Pi-16 channel PWM
& 4 Motor - PSU Board

Relay & Motor Series

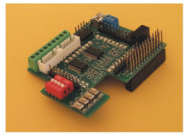


Rs-Pi- uln2803
SPI AD/DA -1-Wire
Multi-function Board

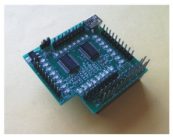


Rs-Pi- 2 Relay +
Step Motor Board

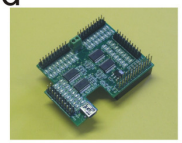
i2c & SPI GPIO Board



Rs-Pi-Multi-function
32 GPIO (i2c/SPI) Board



Rs-Pi-32 GPIO
(i2c/SPI) Board



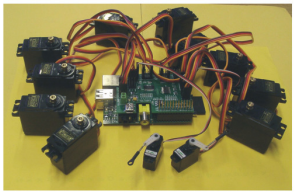
Rs-Pi-64 GPIO
(i2c/SPI) Board

Rs-Pi-128 GPIO
(i2c/SPI) Board

Rs-Pi- LED 24x16
Matrix Board

Rs-Pi-LCD-Master
Board (84x48,16x2,20x4)

Rs-Pi- RS232
console cable



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